Association for Information and Image Management

MS303-1980

Centimeter

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 mm

1 2 3 4 5

Inches

Thomas A. Edison Papers

A SELECTIVE MICROFILM EDITION

PART II
(1879–1886)

Thomas E. Jeffrey
Microfilm Editor and Associate Director

Paul B. Israel
Assistant Editor

Mary Ann Hellrigel
David W. Hutchings
Douglas G. Tarr
Robert A. Rosenberg
Editorial Associates

Leonard DeGraaf
Joseph P. Sullivan
Alan Stein
Karen Kozak
John Deasey
Barbara B. Tomblin
Jacquelyn Miller
Maria Antonakakis
Student Assistants

Keith A. Nier
Assistant Editor

Reese V. Jenkins
Director and Editor

Sponsors
Rutgers, The State University of New Jersey
National Park Service, Edison National Historic Site
New Jersey Historical Commission
Smithsonian Institution

University Publications of America
Frederick, Maryland
1987

Thomas A. Edison Papers
at
Rutgers, The State University
endorsed by
National Historical Publications and Records Commission
18 June 1981

The original documents in this edition are from the archive at the Edison National Historic Site at West Orange, New Jersey.

THOMAS A. EDISON PAPERS

Reese V. Jenkins
Director and Editor

Thomas E. Jeffrey
Associate Director and Microfilm Editor

Assistant Editors
Paul B. Israel
Robert A. Rosenberg
Keith A. Nier
Andrew Butrica

Research Associates
Douglas G. Tarr
Mary Ann Hellrigel
David W. Hutchings

Assistant to the Director
Helen Endick

Secretary
Grace Kurkowski

Student Assistants
Leonard DeGraaf
Alan Stein
Jacquelyn Miller
Joseph P. Sullivan
Karen Kozak
Granville Miller

FINANCIAL CONTRIBUTORS

PRIVATE FOUNDATIONS

Alfred P. Sloan Foundation
Charles Edison Fund
The Hyde and Watson Foundation
Geraldine R. Dodge Foundation

PUBLIC FOUNDATIONS

National Science Foundation
National Endowment for the Humanities

PRIVATE CORPORATIONS AND INDIVIDUALS

Alabama Power Company
Amerada Hess Corporation
AT&T
Atlantic Electric
Association of Edison Illuminating Companies
Battelle Memorial Institute Foundation
The Boston Edison Foundation
Cabot Corporation Foundation
Carolina Power and Light Company
Consolidated Edison Company of New York, Inc.
Consumers Power Company
Corning Glass Works Foundation
Duke Power Company
Exxon Corporation
Florida Power & Light Company
General Electric Foundation
Gould Inc. Foundation
Gulf States Utilities Company
Idaho Power Company
International Brotherhood of Electrical Workers
Iowa Power and Light Company
Mr. and Mrs. Stanley H. Katz
Matsushita Electric Industrial Co., Ltd.
McGraw-Edison Company
Middle South Services, Inc.
Minnesota Power
New Jersey Bell Telephone Company
New York State Electric & Gas Corporation
North American Philips Corporation
Philadelphia Electric Company
Philips International B.V.
Public Service Electric and Gas Company
RCA Corporation
Robert Bosch GmbH
San Diego Gas & Electric
Savannah Electric and Power Company
Schering Plough Foundation
Texas Utilities Company
Thomson-Brandt
Transamerica Delaval Inc.
Westinghouse Educational Foundation
Wisconsin Public Service Corporation

START

38

A Note on the Sources

The pages which have been filmed are the best copies available. Every technical effort possible has been made to ensure legibility.

THOMAS A. EDISON PAPERS

A SELECTIVE MICROFILM EDITION
PART II
(1879-1886)

REEL 38

NOTEBOOK SERIES (NBK-16)

Menlo Park Notebooks, #128 - #148

Menlo Park Notebook #128 [N-80-00-06]

This is the second of three notebooks that contain the results of a search, conducted by Otto Moses during the summer of 1880, for literature relating to the electric light. (See also Menlo Park Notebooks #127 and #176.) The citations are listed in alphabetical order by author. There are two sets of listings, beginning on pages 2 and 210. The book contains 282 numbered pages.

Blank pages not filmed: 1, 278-282.

Albert, Dominique. 2.

Alderson, Dr. James. 3.

Allen. William & Wm. Haseldine Pepys

Alluaud (aîné), F. 2.

Carbon. Process of carbonizing turf without close vessels, the peat furnishing its own caloric, without producing ashes. [1839]

Manch. Soc. Mem. VI., 1842 pp. 399–408.

" On an artificial formation of plumbago [1825].

Camb. Phil. Soc. Trans II. 1827 441–443.

" On the quantity of carbon in carbonic acid and on the nature of the Diamond.

Phil. Trans. 1807 pp. 267–292: Bibl. Britann. XXXVI., 1807. pp. 313–344., Gehlen, Jour. V., 1808, pp. 664–689.

Affinity Reflections on the affinity or degrees of tendency to combine which exist between mineral substances on coming into existence

Journ. of de Phys LIV. 1802 p. 390.

— , 7. (see Gay Lussac, 65)

Alter, D.

Altmütter O. J. G.

Andrews, Thomas. 10. 22.

Carbon. Analysis of a carbonaceous substance found in a porcelain furnace.

Annal. de Chemie IV., 1817, pp. 67-70.

Spectrum. Com-bustion of Metals. On certain physical properties of Light produced by the combustion of different metals in the Electric Spark refracted by a prism.

Silliman Journ. XVIII., 1854, pp. 55-57.

Loop. Platinum Wires. On preparing Wollaston's platinum wires.

Gilbert. Annal. LVIII., 1818, pp. 434-437

Loop. Gases. Cooling of y. On the cooling power of the gases.

Irish Acad. Proceed. I. 1841., pp. 465. 468

Vacuum. On a method of obtaining a perfect vacuum in the receiver of an air pump.

Phil. Mag. III. 1852. p. 104-108

Journ. de Pharmacie XXIII, 1853 p. 440-442

Poggen. Annal. LXXXVIII., 1853 p. 585-590

" Second note on Ozone.

4-. Roy. Soc Proc.. IX.. 1859.. 606-608

Arnot, Neil. 3.

Ashby, J. Eyre. 1.2.

Attfield, John, 6.

Aubergier, Hector, 2.

Aubert, —

Furnace On the regulation of combustion.
Brit. Assoc. Rep. 1847. (pt. 2), p. 47-48.

Loop On (so called) catalytic action and combustion; and theories of catalysis.
Roy. Inst. Proceed. II. 1854-58. p. 68-71.
Erdmann. Jour. Prakt. Ch. LXVII., 1856, p. 6-7

On the metallic and other oxides in relation to catalytic phenomena.
Roy. Soc. Proceed. VII. 1854-55, 322-326.

Spectroscope On the spectrum of carbon.
Phil. Trans. 1862, p. 221-224.
Chem. Soc. Journ. I. 1863, p. 97-100.
Pharmaceut. Journ IV., 1863, p. 94-97.

Loop On the combinations of Hydrogen with the metalloids.
Journ. de Pharm. XXII., 1836, p. 257-265

Loop Moulds Note on the spontaneous ignition of pulverized charcoals.
Ann. de Chemie. XLV., 1830. p. 73-84.
Edinburg. Journ. of Science. IV. 1831. 274-27[illegible]
Roy. Instit. Journ. I., 1831. p. 617-619.

Avogadro, A. & Botto

Meter. Memoir on the relations between the conducting power of liquids for electric currents, and the resulting chemical de-compositions. [1838]

Torino. Mem. Accad. I., 1839. p.179-218; Annal. de Chemie, LXXI., 1839, pp. 5-20.

Baillet, A. 7

Baird –

Barlow, Peter, 11.

Barreswill, L. C. A., & Chas. Boudault.

Barthe, E. 1, 2.

Moulds Note on the carbonization of wood & turf.
Journ. des Mines, XI., 1801. p. 253–256.

Mercury An account of the effects of thirty tons of Quicksilver escaping, by the rotting of leather bags, into the bilge water of the "Triumph" man-of-war.
Nicholson Journ. XXVII., 1810. 132–134.
Gilbert Annal. XL. 1812. p. 347–348.

Loop. On the anomalous magnetic action of iron between the white hot and blood red heat.
Phil. Trans. 1822., 117–126.

Loop. Facts contributing to the history of catalytic force. Decomposition of certain bodies in the benzoic series, under contact.
Journ. de Pharm. V., 1844. 265–268;

Globes Absorbtion of light by glass.
Presse Scientifique 1., 1860 p. 95.

Carbon. On the products extracted from coal tar.
Pr. Sc. II., 1860, 329–330.

Baudrimont, A. 6. 7.

Baudrimont, Ernest.

Beale, Lionel, S. 5.

Beau de Rochas, Alphonse.

Becquerel, A. C., 8.

Loop Explanation of a phenomenon observed when pouring water on bodies heated to redness.
Annal. de Chemie. LXI., 1836, p. 319-330.

" Note on the phenomena of decrepitation.
Comptes Rendus, II., 1836, p. 494-496.

Vacuum Investigation on the comparative duration of the flow of gases.
Journ. de Pharm. XXIX, 1856 p. 266-270.

Loop Method of applying chemical reagents to minute quantities of matter.
Journ. Microsc. Sci. II., 1854 p. 58-59.

Vacuum General formulae for flow of elastic fluids with or without stoppage.
Paris. Comptes Rendus, LVII., 1863. p. 910-913.

Loop On the developement of electricity by the contact of two portions of the same metal, in a sufficiently unequal condition of temperature; and on voltaic piles constructed by means of wires of the same metal, and even with but one wire, &c.
Annal. de Chemie XXIII., 1823. p. 135-155.

Bede, Emile, 2.

Beetz, W. 3.

——, 14.

——, 16

Vacuum. On the ascent of water, and descent of Mercury. Mercury in capillary tubes.

Bruxelles, Mem. Couronn. XXV., 1851-53.

Loop. On the color (blue) which iron assumes, and the relations which exist between this phenomenon and the passive state presented by the same metal.

Archives de l'Electricité IV., 1844, p. 509-515.

Poggendorff's Annal. LXII., 1844, p. 234-40.

Loop. The action which is produced on the strength of a current by heating and shaking the electrodes.

Pogg. Annal. LXXIX., 1850, p. 98-112.

Dynamo-machine. On the conductivity assumed by insulators on being heated.

Poggend. Annal. XCII., 1854, p. 452-466.

Annal. de Chimie. XLII., 1854, p. 247.

Phil. Mag. VIII., 1854, 191-201

Bellani, Angelo. 26.

———, 42.

Berthelot, (Immediate analysis of different kinds of [illegible]
Chem News, xix, No. 483. Mar. 5, 1869.
480 " 19 "
485 " 25 "

Berthollet, Claude Louis & Vauquelin.

Bertrand, A. & Jamin.

Bischoff Gustav. 21

Loop. Conjectures concerning the property possessed by certain substances, especially platinum, of combining hydrogen and oxigen gases.
Brugnatelli, Giorn, VII., 1824, p. 138-151.

" On spontaneous inflamation of platinum and other substances. &c.
An. Soc. Lomb. Veneto. IV., 1834. p. 227-235, 250-256, 297-302.

Loop. Moulds. On the effect of pressure in modifying the action of heat.
Annal. de Chim. LIX., 1806, p. 170-179.

On condensation of gases on the surfaces of solids.
Paris, Comptes Rendus, XXXVI, 1853, p. 994-998.

Globes. A curious appearance exhibited by certain kinds of glass, when exposed for a length of time in a vacuum.
Pogg. Annal. I., 1824, .. 397-402.

Böhm, C.

Bouet-Bonfil

Brame, Ch. C.

Brewster, Sir David, 113.

————, 268.

Furnace. gas. On gas lamps and gas furnaces.
Wien. Sitz. Bericht. XIX., 1856. 374–383.

Carbonizing. Easy decomposition of ammonia, being a new source of pure hydrogen for the reduction of metallic oxides.
Annal. de Chemie, XXXVI., 1852. p. 225-228

Mercury fumes. On the vaporization of Mercury at ordinary temperatures.
Paris, Soc. Philomath. Proc. Verb. 1849. 98-100

Mercury. vapor. On the limit of the vaporization of mercury.
P. Comptes Rendus XXXIX., 1854 p. 1013–1016.

Furnace, gas. Notice respecting a method of producing an intense heat from gas for various purposes in the arts. [1826]
Edinb. Journ. Sci. 1., 1829. p. 104-108.

Glass. On the absorption of matter by the surfaces of bodies.
Brit. Ass. Rep. 1855. pt 2. p. 9.

Brewster, Sir. David,

Brion, -

Brongniart, Adolphe. 51.

Brunner, Carl. 64.

× On the pressure cavities in Topaz, Beryl and Diamond &c.
Edin. Roy. Soc. Trans. XXIII., 1861, p. 39-44.

Globes. Improved apparatus for generating chemically pure Hydrofluoric Acid.
Liebig Ann. CXI., 1859. 380-382.

Laboratory. HS.. Action of Sulphur on a certain number of organic substances. Paraffin
Comptes Rendus. LVI., 1863, .. 876-877.

Loop. Microscope. Report of a memoir of M. Payen, intitled: "Compliment to a memoir on the chemical composition of vegetable tissue and on the different states of aggregation of such tissue.
Paris, Comptes Rendus, X, 1840, 941-945.

Loop. Preparation of platinum black.
Bern. Mittheil. 1858... 83-85.

" Easy method of preparing perfectly pure platinum black.
Pogg. Ann. CV. 1858 p 496

Buff, Henrich. 18.

—— .49.

—— and Hoffmann.

Bunsen, R. W. 49

Burnett, Sir Wm.

Busk, George & D Cooper.

Vacuum Experiments &c. on the contraction of liquids
Air pump in their motion through narrow orifices.
Pogg. Ann. XLVI., 1839.. 227- 242.

Globes. On the electrical conductivity of heated glass.
Platinum wire. Ann. de Chemie XLII., 1854... ~~224-234~~ 125-128.

Decomposition of gaseous compounds by electrical incandescence.
Liebig Annal. CXIII., 1860.. 129-150.
Chem. Soc. Journ. XII., 1860. 273-289.

Carbon Loop. On the law of absorption of gases.
Annal. de Chemie, XLIII., 1855.. 496-507.

Mercury vapors. An account of the effect of mercurial vapors on the crew of H. M. S. "Triumph", 1810.
Phil. Trans. 1823. 402-408.
Silliman. Journ. X., 1826,.. 181-183.

Fibre

Remarks on the structure of fibre.
Microscop. Journal I., 1842.. 257-261.

Chevreul, Michel Eugène, 73.

Claudet, A. 7.

Clifton R.B. and Roscoe.

Cloez S. & Girard

Vacuum. On the employment of caoutchouc as a means of closing vessels intended to be hermetically closed.
Comptes Rendus, XIV., 1842. 783-785.

Mercury fumes. On the dangers of the mercurial vapours in the Daguerreotype process, and the means of obviating the same.
Brit. Assoc. Rep. 1851. (pt. 2) p. 45.

Loops. Carbon spectrum. On the effect of increased temperature upon the nature of the light emitted by certain metals and metallic compounds.
Manchester. Phil. Soc. Proceed. II., 1860-62. p. 227-230.
Chemical News, V., 1862.. 233-234.

Air pump. rubber tube. Note on the presence of chlorine and of sulphur in the natural or ~~artificial~~ manufactured caoutchouc.
Comptes Rendus, L., 1860... 874-876.

Clathupe, Chas. J., 5.

Cohn, Ferdinand, 30.

Congreve, Sir Wm.

Corbett, F. A.

Corenwinder, Benjamin, 1.

——, 12.

Globes On certain modifications of the power of heat and light when transmitted through glass.
Phil. Mag. XVI., 1840..467-471.

Furnace On mineral and resin oils.
Breslau Schles. Gesell. Uebersicht 1855..268-271.

" Observations on gas light establishments,
explosions made to determine the comparative explosive force of carburetted hydrogen gas and gun powder.
Thomp. Ann. Phil. V., 1823..411-426.

Fibre Indigenous fibrous plants.
Victoria, Trans. Roy. Soc. V., 1860...205-214.

Vacuum Note on the preparation of nitrogen..
nitrogen gas. Annales de Chemie. XXVI., 1849.. 296-297

Researches on the assimilation of carbon by the leaves of vegetables..
An. de Chemie. LIV., 1858.. 321-356.

Crace-Calvert, F. 25.

Davy, Sir H. 74

Davy, John. 7

— 85.

— 94.

Fibre. On the action of organic acids on cotton and flax fibres.
Edinb. New Phil. Journ. I., 1855.. 108-113.

Vacuum. On the electrical phenomena exhibited in vacuo. [1821]
Phil. Trans. 1822. 64-75
An. de Chemie, XX., 1822, 168-122.

Loops. On the property belonging to charcoal and plumbago, in fine plates and particles, of transmitting light. [1843]
Edinb. Roy. Soc. Trans. XV., 1844.. 335-342.

Mercury vapor. On the vaporization of Mercury.
New Phil. Journ. XXXIX., 1845. 49-50.

Microscope. On the use of the Microscope as an aid in chemical enquiry.
Edin. new Phil. Journ. XLII., 1847. 38-43.

Döbereiner, J. W. 107

——, 116.

—, 132.

—, 169.

Doolittle, Isaac, 5.

Erdmann, Otto Linné, 12.

Globes On the capillary action of cracks.
An. de Chemie. XXIV., 1823. 332–335

Vacuum Platin. wires Platinum, a promoter of gaseous combinations.
Kastner Archiv. Naturl. II., 1824, 225–226.

On the preparation of platinum black.
Liebig An. II., 1832. 1–5. and also
" " XVII., 1836. 67–69.

Platinum New contributions to the history of the chemical dynamics of Platinum.
Poggend. An. LXIV., 1845. 95–96.

Wood carbon. Notice of a new method of charring wood.
Silliman. Journ XVII., 1830. 395–397.

Platinum glass. On platinizing of Glass
Erdmann. Journ. Tech. Chem. III., 1828 – 395–396.

Erman, Paul. 24.

Esprit

—— , 2.

F

Fairbairn Wm, 23.

—— Wm & Th Tate

Platinum Notice on a reciprocity of action both isolating and conducting, exercised by incandescent platinum on the two electricities &c.
Annal. de Chemie. XXV., 1824.. 278-285.

Loop coaling. Memoir on the absorption of saline substances by charcoal.
Erdm. Journ. Pract. Chem XLVIII, 1849 424-435.

Loop coaling On carbon and its action on metallic solutions.
Journ. Chem. Med. VI., 1850.. 502-506.

Globes On the collapse of glass globes and cylinders.
Brit. Ass. Reports 1858.. 174-176.

" On the resistance of glass globes and cylinders to collapse from external pressure, and on the tensile and compressive strength of various kinds of glass.
Phil. Trans. 1859.. 213-247.

Faraday, M., 24.

———, 76.

———, 155.

Fischer, N. W., 45.

———, 50.

Mercury vapor. On the vapor of Mercury at common temperatures.
Quart Journ. Sci. X., 1821.. 354-355.

Platinum On the power of metals and other solids bodies. to induce the combination of gaseous bodies.
Phil. Trans. 1834.. 55-76.

" On platinum.
Roy. Inst. Pro. III., 1858-62.. 321-322.

Furnace. Gas. On gas furnaces.
do. III., 1858-62.. 536-539.

Platinum On heat with special reference to the conductibility of Platinum.
Pogg. An. XIX, 1830.. 507-513.

Non vaporization of a liquid falling in an small quantity on an incandescent metal.
Silliman. Journ. XXII., 1832.. 365-366.

Fizeau, H. L., 425.

——— & L. Foucault.

Fleury, A. L.

Forbes, Jas. D., 65.

———, 100.

Foucault, Leon, 2.

Light intensity On the intensity of the light of the pile compared with sunlight.
Paris. Bull. Soc. Encour. XLIV., 1845. 393. 396

E. light Researches on the intensity of the light emitted by the carbon in Davy's experiment
Comptes Rendus. XVIII., 1844.. 746–754

Can light, heat and motion be successfully and economically produced by electricity?
Frank. Inst. Journ. XLII., 1861.. 416.

Calorimeter On the effect of the mechanical texture of screens on the immediate transmission of of radiant heat. [1839]
Edin. Roy. Soc. Trans. XV., 1844.. 1–26.

" On the intensity of heat reflected from glass.
do., Proceedings. II., 1851.. 256–257.

A. light Apparatus for rendering constant the light, emanating from a carbon, between two poles.
Comptes Rendus XXVIII., 1849.. 68–69.

Foucault, Léon 3.

———, 19.

Frankland, Edward, 5.

———, 20.

Fremy, Edmond, 42

———, 44.

Elight. On the employment of the electric light.
Paris Soc. Phil. Proc. Verb. 1849. 16–20.

A. light. Note on the light of the voltaic arc.

Observations, economical and sanatory, on the employment of chemical light for artificial illumination.
Roy. Inst. Proceed. I., 1851–54. 319–325.

Vacuum. On combustion in rarified air.
Roy. Soc. Proc. XI. 1860–62. 137–140.

Distinctive characteristics of ligneous fibre, of cortical fibre, and of the cellular tissue which constitutes the pith of trees ....
Comptes Rendus XLVIII., 1859. 275–279.

Wood. Researches on the chemical composition of wood.
do., XLVIII., 1859... 862–868.

Fromberg, P. F. H. 2

———, 4.

Fusinieri, Ambrogio. 12. + 14. + 32.

Wood On cellulose.
Liebig Annal. XLVIII., 1843.. 353-356.

Fibre On the cellular fibre and the incrusting matter of plants.
Edinb. Roy. Soc. Proc. I. 1845. 454-457.

Catalysis On the cause of combustion of gaseous substances by means of the surface of a metal.
Brugnatelli, Giornale VII., 1824.. 371-376
443-449.

Gassiot, J. P., 15.

———, 16.

———, 17.

———, 18.

———, 19.

Globes On the phosphorescent appearance of electrical discharges in a vacuum made in flint and potash glass.
Brit. Assoc. Rep. 1858 (pt. 2) p. 26.

Vacuum On electrical discharges as observed in highly rarified carbonic acid in contact with potash.
Brit. Assoc. Rep. 1858 (pt. 2), 50.

Vacuum Geis. Light On the stratification and dark bands observed in electrical discharges in Torricellian vacua.
Phil. Trans. 1858, 1–16.

El. Light On the stratified electrical discharge, as affected by a movable glass ball.
Brit. Assoc. Rep. 1859 (pt. 2), 11.

Vacuum Geis. Light On the stratifications in electrical discharges as observed in Torricellian and other vacua.
Phil. Trans. 1859. 137–160.
ϕ. Roy. Soc. Proc. 1859. IX. 601–605

Gassiot, John Peter, 20.

——— ,21.

——— ,22.

——— ,23.

——— ,24.

Vacuum Gis. Light On the electrical discharge in vacuo with an extended series of the voltaic battery.

Roy. Soc. Proceed. X., 1859-60 .. 36-37.

" On the interruption of the voltaic discharge in vacuo by magnetic force.

do. 1859..269-274.

" On vacua as indicated by the mercurial siphon-gauge and the electrical discharge

do. 1859-60..274-275.

" On the luminous discharge of voltaic batteries, when examined in carbonic acid vacua.

do. 1859-60..393-404.

El. Light, Spark On the application of electrical discharges from the induction coil to the purposes of illumination.

do. 1859-60..432.

Gassiot, J. P., 25.

——, 26.

——, 27.

Gaugain. J. M. 13.

Geis Light. heat. On the heat which is developed at the poles of a voltaic battery during the passage of luminous discharges in air and in vacuo
Roy. Soc. Proc. XI., 1860-62 .. 329-335.

On the deposits of metals from the negative terminal of an induction coil during the electrical discharge in vacuo.
Brit. Assoc. Rep. 1861. (pt. 2) 38-39.

E. Light. Experimental investigations on the stratified appearance in electrical discharges. Effect obtained by varying the resistance.
Roy. Soc. Proceed. XII., 1862-63, 329-340.

" Note on the stratification of the electric light.
Comptes Rendus XL. 1855 .. 1036-1039.

Conduction gaseous. Note on the electric conductivity of air.
do. XLI., 1855-152-156.

medium " Note on the laws of propagation of electricity in medium conductors.
An. de Chimie. LIX., 1860 .. 562.

Gaugain, J. M. 33

—— , 42.

Gaulthier de Claubry, 39 + 40.

Girard, P. S. 16.

Girou de Buzareingues, Ch. 16.

Conductors Note on the propagation of electricity.
Insulation Perturbation resulting from the action of the air ~~ots~~ of imperfect insulation of conductors.
Comptes Rendus LI., 1860..932-935.

Insulators On the inductive capacity of insulators.
Comptes Rendus LXI., 1863..799-803.

Rubber On the means of determining the chlorine and sulphur in caoutchouc vulcanized by chloride of sulphur.
Comptes Rendus, XLIX., 1859..76-77.

Blast Memoir on the flow of atmospheric air and carburetted hydrogen gas in conducting tubes.
An. de Chemie XVI., 1821. 129-152.

Fibre Memoir on the order of distribution of the fibres in the central part of the stem.
Ann. Sci. Nat. XXX., 1833.. 337-350.

Gladstone, J. H., 23.

———, 42.

———, 43.

Gore, George, 27.

Graham, Thomas. 14.

Grailich, Wm. Joseph. 13

Griffin, J. J. 9.

Fluor-escence Notes on some substances which exhibit the phenomena of fluorescence. [1854]
Edin. New Phil. Journ. I., 1855. 83-90.

" On the fluorescence and phosphorescence of diamonds.
Brit. Assoc. Rep. 1859. (pt. 2), - 69.

" On photographs of fluorescent substances
do.

Mercury On the adhesion of liquids to mercury.
Phil. Mag. XXVI., 1863. 142-143.

Vacuum On the application of spongy platinum to eudiometry. (1)
Quart. Journ. Sci. II., 1829. 354-359.

Fluor-escence. On fluoresence.
Presburg. Verhandl. II., 1857 (Abh.) 11-18.

Furnace gas. Description of a patent gblast gas furnace.
Chem. News I., 1860. 27-29; 40-41.

Griffiths. Thomas

Grove, Wm. Robert.. 3.

—, 8.

—, 21.

—, 27.

Wood carbon. Experiments on the proportion of charcoal obtained from woods having a greater specific gravity than Box.
Quart. Journ. Sci. XVI., 1823.. 264–265.

Catalysis On voltaic series and the combination of gas by platinum.
Phil. Mag. XIV., 1839.. 127–130.

On the deflagrations which take place between conductors which communicate with the poles of a voltaic battery.
Bibl. Univer. XXV., 1840.. 426–428.

On the application of voltaic ignition to the lighting of mines.
Phil. Mag. XXVII., 1845.. 442–446.

On certain phenomena of electric ignition, and the decomposition of water into its constituent gases by heat. [1846]
Phil. Trans. 1847.. 1–16; 17–22.

Grove, Wm. Robert, 29.

—, 32.

—, 45

—, 46.

—, 47.

On effect of surrounding media on voltaic ignition. [1848]
Phil. Trans. 1849.. 49-60.

On the transmission of electricity by flame and gases.
Roy. Inst. Proc. 1., 1851-54.. 359-362.

On the striae seen in the electrical dis-charge in vacuo.
Phil. Mag. XVI., 1858.. 18-22.

On the influence of light on the polarized electrode.
Phil. Mag. XVI., 1858.. 426-433.

On the electrical discharge, and its stratified appearance in rarified media.
Brit. Assoc. Rep. 1856.. (1856 pt. 2. 10-11.

Vacuum Geis. Light. On the limit of inflammability in combustible gas mixtures on decreasing their density, and on the color of the electric spark in different media.
Annal de Chemie, LXXXII., 1812 .. 34–53.

" Experiments and ideas on combustion, on electrical conductivity of different gases &c.
Schweigger Journ. IX. 1813.. 327–337.

Carbon, Wood. Report on the manufacture of peaty charcoal. An. des Mines XIII., 1838 .. 487–489.

Fluorescence. Note on the phenomena of fluorescence.
Comptes Rendues, XLV, 1857 .. 773–775.

Vacuum Geis. Light. On the propagation of light in vacuo. Brit. Assoc. Rep. 1838 (pt. 2.) 2–6.

Moulds. Experiments on the effect of long continued heat on animal and vegetable substances.
Brit. Assoc Reports. 1834 – 576–578.

Hart, William

Hassenfratz, J. H. 31.

Heintz, W., 45.

Henry Wm. Charles, 4.

Herschel, Sir. J. F. W. 31.

——, 27.

E Lamp On an improved electric lamp.
Brit. Assoc. Rep. 1858 (pt. 2) . 55. 56.

Wood On the bending of wood.
Journ. des Mines XVI., 1804 . 475-482.

Glass On appearances on glass rods which have
heating been drawn through a flame.
Halle Jahresbericht. Nat. Wiss. Ver. V., 1852.
39-49.

Catalysis Experiments on the action of Metals in
determining gaseous combination.

Mercury On the mechanical effects produced when
Electro- a conducting liquid is electrified in con-
lysis. nexion with mercury.
Edinb. Journ: of Scien: II., 1825. 193-199.

" On certain motions produced in fluid
conductors when transmitting the electric
current.
Phil. Trans. 1824. 162-196.
Ann. de Chemie. XXVIII. 1825 -- 280-318.

Hess, Hermann, 24.

Hodges, Jno. F. 7.

Hoffacker, G. & A. Geuther.

Hoffman, Jac. Fried.

Hofman, A. W. & Ho Buff

Glass. Description of two new lamps [for organic
(blowing) analysis and for glass blowing.]
Pogg. An. XLI., 1837 – 198. 202.

Fibre On the separation of the fibre of the flax
plant:
Chemist IV., 1857.. 257 – 263.

Globe, On the action of Chlorine in sunlight on
deposits the hydrochloric acid compounds of some
on. organic bases.
Liebig. Annal. CVIII., 1858.. 51 – 55.

Wood, How to dry parts of plants, or whole plants,
drying. so as to preserve their natural form and
direction.
Hermbstädt. Museum XI., 1817.. 128-141.

Edison's Decomposition of Gaseous Compounds
light. by electrical incandescence.
Chem. Soc. Journ. XII., 1860.. 273-289.
E. light. On magneto-electricity and its application to
light-house purposes. Journ. XII.,
Electrician, IV., 1863.. 66-68; 81-82; 92-94.

Horsford, E. N. 12.

——, 22.

Ibbetson, Agnes, 31

Ivory, James, 12.

Jacobi, M. H., 33.

Jamin, Jules & A Bertrand. (see p. 17.)

Mercury On the permeability of metals to Mercury.
Silliman Journ. XIII., 1852.. 305-318.

Relation of the chemical constitution of bodies to light.
Amer. Assoc. Proc. 1851.. 74-75.

Fibre, wood: On the wood and bark of trees much magnified.
Nichols, Journ. XXXV., 1813.. 87-94.

Mercury Mc Gauge Observations respecting the calculation of the depression of mercury in capillary tubes.
Tilloch. Phil. Mag. LVII., 1821. 421-426.

Meter On the reabsorption of the mixed gases in a voltameter.
Roy. Soc. Proceed. V., 1847.. 667.

O.

Johnston, Christopher.

Joule, J. P., 55.

Jürgensen, Theodor.

Microscope tissue. On a method of preparing and mounting hard tissues for the Microscope.
Silliman. Journ. XXV., 1858.. 232-235.
Journ. Micros. Society VII., 1859.. 258-261.

Wood. On the expansion of wood by heat.
Roy. Soc. Proc. IX., 1857-59.. 3.

On the movement of solid bodies, suspended in liquids under the influence of the electric current.
Reichert Archiv. 1860, 673-687.

Kane, Sir, Robt. John, 51. see!
Koene, C. J. & Bruxelles. Acad. Sci.
Bull. XI, 1844..152-178.

Karmarsch, Karl

Kastner K.W.G., 38

Keith, Patrick, 11 + 15.

On the nature of Aqua Regia, on Hypo-nitric acid as an oxidizing agent, on the constitution of that acid, and the part which its acts to organic substances.
Taylor Sci. Mem. IV., 1846., 415-431.

Edison light On the incandescence of metallic wires in the vapors of volatile substances.
Gilbert. Annal, LXXV, 1823..83-94.

Carbonization. Experiments on the artificial production of the diamond.
Kastner. Archiv. Naturl. XVI., 1829..
154-164.

Fibre On the internal structure of plants.
Phil. Mag. V. 1834..112-121..181-188.
284-291

" Detecting cotton in linen.
Liebig Ann. LXI., 1847-253.255.

King, W.

—, 2.

Knight, R., 2.

Knight, Th. Andrew, 26.

—, 29.

Knop, Adolph + Wilhelm

Globes etched. On the loss of light by glass shades; with a note of additional experiments by JH Storer.
Silliman Journal. XXX., 1860, 420-421.

" On the loss of light by glass shades.
do. XXXI., 1861., 283-285.

" Description of an apparatus for preparing fluoric acid and for etching on glass.
Tilloch, Phil. Mag., XXII., 1803.. 357-359.

Wood On the office of the heart wood of trees.
Phil. Trans. 1818.. 137-143.

" Bamboo Upon the effects of very high temperature on some species of plants. [1819]
Hort. Soc. Trans., III., 1820, 459-465.

On the gases which are contained in the inner spaces of plants.
Chem. Pharm. Cent. Blatt. XXII., 1851.. 609-615.

Knop. Wilhelm, 34

Knox, G. J. 4.

—, 9.

K. F. K.
Koch, F. K. L. 1, 5, 16.

Kolbe, H. 9

Loop. On a property of chloride of platinum.
Chem. Cent. Blatt, IV., 1859.. 241–245.

Glass On the oxydating power of glass for metals.
Irish Acad. Pro. I., 1841.. 369–370.

On the compound nature of nitrogen.
do., II., 1844.. 171–172.

Aero-statics Experiments and observations on the velocity and quantity of compressed atmospheric air issuing from tubes and from openings of different construction
Göttengen, Studien Verein I., 1824. 1–232.

Investigations on the electrolysis of organic compounds.
Liebig Annal. LXIX., 1849, 257–294.

Dynam. mach. On the electro magnetic action of galvanic currents of very short duration
Pogg. Annal. LXXXVII., 1852.. 514–540.

Kopp, E.

Kuhlmann, F. 25. and. 27

——, 33.

Kühn, O. B., 15

Aerostatics. Report on the memoire of M. Kurtzing entitled "Essay on the direction of airostats.

Platinum sponge. Note on some new reactions determined by platinum sponge, and considerations on the services that this substance is apt to render to science.

Comptes Rendus VII., 1838.. 1107–1110

On the incrustation of steam boilers. New method to prevent the lime deposits clinging to the same.

Liebig. Ann. XXXVIII., 1841.. 53–57.

Furnace. On the use of illuminating gas in chemical experiments.

do., LXXIV., 1850.. 115–116.

Aerostatics. Theory of the flight of the bird and construction of flying automata.

Dingler Pol. Journ. CXVII., 1850.. 100–106.

Kunth, J. S. 8.

Kupffer, A. T. 63, 64, 65, 66.

Lafond —

Lamarle E., 2.

Lamont, J. 79.

Lampadius, W. A. 69.

Bamboo. On the species Bambusa
Journ. de Phys. XCV., 1822..148-151.

Influence of elasticity temperature on the elasticity of solid bodies.
St. Petersburg Math. Acad. Sci. Bull. XIV., 1856, col. 273-284 .. 289-299.

Glass blowing On the art of glass blowing
Liebig Annal. VII., 1833, 298-313

Memoir on the bending of wood.
Der Civilingenieur I., 1854, 218-222

Dynamo machines On the most advantageous forms for magnets.
Phil. Mag. XXII., 1861, 369-376.

Furnace Assaying: On scorification by coal gas
Erdmann Journ. Tech. Chem. V, 1829, 206-215.
VI., 1829, pp. 199-200.

Landur, N.

Lankester, Edwin.

La Peyrouse, Isidor de 1. + 5.

La Place, P. S. (Marquis de)

La Provostaye, F. H. de 18 + 19.

Aerostatic Resumé of some calculations on aerial navigation.
Presse Scientifique II., 1861. 540-546.

" On the weight of motors light which may be constructed.
do., II, 1863. 679-683.

Fibre On the formation of woody tissue.
Brit. Ass. Reports. 1839., pt. 2., p. 78-79.

" Memoir on the fibrous system of vegetables.
Toulouse Mem. Acad. 1., 1827. 207-208

Mercury Gauge On the depression of mercury in a barometer tube, due to its capillarity
Tilloch, Phil. Mag. XLVII., 1816. 102-107.

Loop Are different bodies brought to incandescence equally luminous at the same temperature
Comptes Rendus. LVII., 1863. 637-639.

La Provostaye, F. H. de & P. Desains

——, 26 & 27.

Larivière & L. J. Gay-Lussac.

Lauwerenburg, Deiman &c. 2

Lawson, George, 15.

Le Bon.

Loop Note on a fact relative to heating a platinum platinum wire by the electric current.
Comptes Rendus, XXXVII., 1853..749-752.

Loop. Determination of emissive capacity at high temperatures.
do. XXXVIII., 1854..440-443

Carbon- On the decomposition of essential oils by -izing. heat.
Comptes Rendus XVI., 1841..125

Furnace On the leaking of gas through glowing earthenware pipes.
Schérer, Journ. Chemie IV., 1800-1-27.

Fibre Remarks on the microscopical structure of Cotton fibre. [1857]
Edinb. Bot. Soc. Trans. VI., 1860-8-14.

Vacuum. A Description of a Mercury pump. Transl.
Carl's Repertorium III. 1867. 267-269.

Lecoq de Boisbaudran — 17.

Landiganck D.

Lees, Edwin, 33.

Lefort Jules, 40 — 41.

——— 41

LeHer —

Lenz. R., 4.

Spectrum. On the spectrum of the vapor of water.
Compt. Rend. LXXIV., 1871.. 1322 _ 23.

Fibre On the cause of the fall of leaves. Trans.
Journ. Botany I., 1872.. 173

" On the favored localities to which many remarkable plants are confined. [1868]
Caradoc field Club Trans. 1869.. 73 – 80

Note on the employment of vegetable tar.
Journ. of Pharm. VIII., 1868.. 16 – 18

Insulation Investigation on the preparation and chemical properties of tar water.
do. VIII., 1868.. 174 – 182.

Aerostatics Modified aerostat.
Compt. Rendus. LXXII., 1871.. 122.

On the influence of temperature on the conductivity of metals. [1869]
St. Petersb. Acad. Sci. Mem. Bull. XIV. 1870.. col. 54 – 59.

Leroux, F. P. 19

Leroux, F. P. 34

——— 35

——— 37.

——— 38

On the law of the disengagement of heat by the passage of a current of electricity in metallic conductors and in voltameters.
Annal. de Chem. VI., 1865.– 86–104.

Rubber On some observations concerning the porosity of caoutchouc.
Comptes Rendus, LXIII., 1866.. 917-918

Loops. On the cause of undulations produced in metallic wires by the discharge of batteries.
Compt. Rend. LXIV., 1867.. p. 908-911

El. Light On the spontaneous reestablishment of the voltaic arc after an extinction of short duration.
Compt. Rend. LXV., 1867.. 1149–1150.

El. Light Sundry experiments relative to the production of the electric light.
Chem. News. XVIII., 1868.. 180-183, 195-197

" On the electric light.
Journ. de Pharm. 1868.. 42-47

Leroux, F. P. _ 39

———, 40

———, 41.

———, 42.

———, 47.

El. Light On some experiments relative to the employ-ment of the electric light.
Comptes Rend. LXVI., 1868..42-43

A. Light Note relative to a reclamation of M. Wartmann relative to the spontaneous reestablishment of the voltaic arc after the extinction of an arc of short duration.
do. LXVI., 1868..197-198.

A. Light Association of the incandescence of magnesium with that of carbon in the voltaic arc.
do. LXVI., 1868.. 837-839.

" On the action of the voltaic arc on the alkalies and alkaline earths.
do LXVI., 1868.. 1150-1152

On the distribution of heat and in general of work in the induction apparatus
do LXVIII., 1869..1211-1213.

Leroux, F. P.; 49

Lesevre, E. 9.

———; 10

Lewis, Richard T.

Ligar, Chas. W.

Linsay, W. Lauder, 65.

Response to a note of Mr. Jamin on the subject of the theory of the apparatus of induction
Comptes Rendus. LXVIII., 1869.. 1471-1474.

Note on the memoire of M. Bockholtz [on the regeneration of force]
Annal. des Mines. II, 1872.. 337-342

Reply to the note of M. Bockholtz. on the regeneration of force.
do. IV., 1873.. 18-19.

A Light On some of the microscopic effects of the electric spark.
Quart. Journ. Micros. Sci. VII, 1867. 14-20.

Wood On the grass tree (Xanthorrhoea)
Victoria Roy Soc. Trans. VII. 1866.. 145-147.

Fibre On the economical value and applications of the leaf fibre of New Zealand flax; Phorm. ten.
Journ. of Bot. VII., 1869.. 22, 31, 43-47.

Loesche, (D.) 4

Loewy Benj.

Lommel, Eugen. 19.

Lorenz. Louis, 16.

Loughlin, J. Eneu

Macadam, Stevenson, 25.

On the employment of polarized light for the investigation of the structure of solid bodies
Dresden Sitzungs bericht Nat. Heilkunde 1868-69. 109-112.

Vacuum On the behavior of a thermometer in a vacuum
Roy Soc. Proceed. XVII., 1869. 319-328

Fluorescence On Fluorescence.
Annal. de Chemie XXVI, 1872. 283-285.

On the identity of the vibration of light and the electric current.
Annal. Phys. Chem. CXXXI., 1867. 243-263

Fluorescence On fluorescence [1866]
Amer. Journ. Sci. XLIII, 1867. 239-241.

Photometry On the relative photogenic or illuminating power of vegetable, animal and mineral oils and coal gas. [1871]
Edinb. Trans. Scots Soc. Arts. 1872. 325-343

Mach, Earnest, 9.

McNab, Wm Ramsay, 16.

Magnus, Gustave, 68.

———, 72.

Mallet, J. Wm., 29.

Gas Light Preliminary remarks on the light of incandescent gases.
Zeitschrift, Math. Physik. IX 1864..69-70

Microscope Mode of examining the microscopic structure of plants.
Monthly Micros. Journ. III., 1870.. 31, 36, 154-156.

Carbon Loop On the condensation of gases on the surface of solid bodies.
Annal. de Chem. III., 1864.. 270-280.

Globes On the difference of the heat from rough and smooth surfaces.
do. VI., 1865.. 141-166.
Phil. Mag. XXX.. 1861., 81-95.

Vacuum On the effect upon meteoric iron, as regards the capability of being forged, of previous heating to redness or whiteness, in vacuo.
Brit. Ass. Rep. XLII., 1872, (Sect) 77.

Mallet, J. Wm. 33.

Marchand, L. 7

Marey, J. 28

——, 29

——, 31

—— 32

——, 33 also 34, 35, 37, & 40

Vacuum Examination of the gases occluded from the meteoric iron of Augusta Co. Virginia.
Roy. Soc. Proceed. XX. 1872 - 365 - 370.

Rubber New investigations and researches on caoutchouc
Revue Scientifique 1., 1840 .. 97-99.

Aerostatics On the flight of insects. [1868]
Paris. Mem. Soc. Biol. V., 1869 (C. R.) 136-139

" Mechanical reproduction of the flight of insects.
Comptes Rend. LXVIII., 1869 .. 667-669.

" The movement of wings in insects.
Revue Cours Scientifique, VI., 1869 .. 171-176

" The mechanism of flight in insects.
do. VI., 1869. 252-256.

" On the flight of birds
do., VI., 1869 .. 578-583, 601-604, 646-656, 700-704.
Smithsonian Reports 1869 .. 226-285

Marey, J. 40

Marsh, Benj. V., 5.

Marshall, D. H., 2.

Martin, Adolphe, 5.

Martius, C. A. 8

Martius, J. W. Christian, 30.

Aerostatics Determination of the inclination of the plane of the wing at different instants in its revolution.

Aeronaute V., 1872-76-79

Comptes Rendus, LXXIV., 1872.. 589-592.

Remarks on the luminosity of meteors as affected by latent heat.

Amer. Journ. Sci. XXXVI., 1862.. 92-99.

Loop Note on the rate of decrease of electric conductivity, with increase of temperature.

[1872] Edinb. Roy. Soc. Proc. VIII., 1873-p. 33-34

Globes On silvering glass by inverted sugar

Annal. de Chem. XV, 1868.. 94-100.

Furnace On the preparation of illuminating gas from petroleum.

Deutsch. Chem. Gesell. Ber., I., 1868-88-90

Rubber
Insulation On east indian Caoutchouc.

Repert. Pharm. XXXV, 1830.. 337-360

Mascart, E. 18.

Matteucci, Carlo. 263.

Mathew, George F. 5.

Matthiessen, Augustus, 29.

Maxwell, J. C., 35

VIV

Mayençon + Bergeret (Dr).

On metallic reflection.

Paris. Comptes Rendues LXXVI., 1873..866-869

Loop On the adhesion of gas to the surface of solids

CompteRend. LXIV., 1867..74-75.

Fibre Impressions of Cuba geological & botanical.

Canadian Naturalist VII. 1873..19¾,75-85

On the electrical permanency of metals and alloys.

Brit. Assoc. Reports. XXXIV, 1864 351-352.

On the theory of the maintenance of electric currents by mechanical work without the use of permanent magnets.

Roy. Soc. Proceed. XIV.. 397-402

Clinical means of recognizing mercury in excretions and especially in the urine; and of the elimination and physiological action of Mercury.

Lyon, Mem. Soc. Sci. Med. XVII, 1873-3-21 13.

Mayer, David

Menzzer, Dr.

Merget, A. 2.

——, 3.

——, 6.

Aeronautics. Some remarks on mechanical flight.
Aeronaut. Soc. Report, III., 1868..56–58

Dynamo-mach. The relations which exist between the weight of the magnetising spiral and the magnetising force.
Annal. Phys: Chem. CXXVI., 1865..172–176.
Phil. Mag. XXX., 1865..457–458.

Mercury On the diffusion of mercurial vapors.
Comptes Rendues. LXXIII., 1871–1356–1361.
Annal. de Chemie XXV., 1872.. 121–131.

" On the properties of mercurial vapors.
Lyon, Annal. Soc. Agric., V. 1872., CIV–CVIII.

Influence of the molecular state of bodies on the sensibility which they manifest under the action of light.
Assoc. Française Comptes Rend. II, 1873. 206–207

On flint glass.
Dingler Polyt. Journ. CLXXXVIII, 1868. 483–488

Meusnier –

Meyer, J.

Miller, W.A., 19

Miller, W.H., 42,

Mondot de Lagorce – 5,

Aero-statics. A Memoir on the equilibrium of aerostatic machines on the different means of making them rise and fall, and especially, how to execute manoeuvres without throwing out ballast or losing any gas, and on using in the baloon a particular capacity for containing atmospheric air.
Comptes Rendues, LXXI., 1870.. 569–577.

Mercury Influence of ammonia in shops where mercury is used.
Comptes Rendues, LXXVI., 1873.. 648-649

Rubber On the decay of gutta percha + caoutchouc.
Chem. Soc. Journ. III, 1865.. 273-284.

On graphitoidal Silicon + Boron [1866]
Proceed. Roy. Soc. XV., 1867.. 11–13.

Aerostatics. Note on the force necessary for the propulsion of a balloon and on the descending speed of a parachute.
Aeronaut, IV, 1871.. 181–183

Morin, (le Général) Arthur Jules, 58

Morren, Auguste, 8.

Morton, Henry, 7.

———, 8

———, 9

———, 10

Aerostatics Note on the means of determining the law of ascension and of the horizontal transportation of balloons.
Comptes Rendus LXVII., 1868..635-639

Vacuum Researches on electric conductivity in rarified gases.
Les Mondes. V., 1864., 209-210.

Fluorescence Observations on fluorescence.
Franklin Inst. Journ. LXII., 1871..140-141.

" Fluorescent relations of anthracene and Chrysogen.
do. XIV., 1872.. 269-371.
Amer. Chemist III., 1873.. 81-82.

Fluorescent relations of certain solid hydrocarbons found in petroleum distillates.
Am. Ch. III., 1873. 162-164.

Fluorescent relations of certain solid hydrocarbons found in coaltar + petroleum distillates.
Phil. Mag. XLIV., 1872.. 345-349

Mos. G., 2.

Moss, Richard J., & Draper, H. N.

Mouchet —

Mousson, Albert, 42

——, 44

A. light On an improved electrical light regulator.
Annal. Phys. Chem. CXXXIX., 1870. 495-498

On some forms of selenium, and on the influence of light on the electrical conductivity of this element.
Irish. Acad. Proceed. I., 1873-74. 529-533

On a new instrument for cutting thin sections of wood.
Monthly Microscopic Journ. III., 1870-75.

Researches on the conductibility of metals according to temperature.
Schweizer Naturforsch Gesell Verhandlung. L., 1866. 55-64.

Dynamo. On the distribution of magnetism in the section of a magnet.
Zurich, Vierteljahresschrift. XI. 1866. 182-194.

Moutier, J., 23.

——, 29

——, 28

Moy, Thomas, 2.

Müllendorf, Auguste, 2.

Müller, Baron Ferdinand von, 53

Müller, Hugo, 17.

On the thermic effects of magnetisation.
Comptes Rendues, LXXV., 1872..1619-1621.

Clamps On the discharge of electrified conductors.
Comptes Rendues. LXXVII., 1873..1238-1241.

Loop. On the vapors given off by the same body in two different states, when exposed to the same temperature.
do, LXXVI., 1873..1077-1080.

Aeronautics. On aeronautical principles.
Aeronaut. Soc. Rep. III., 1868..39-40.

Photometry On a photometric method.
Luxembourg, Publ. Inst. Roy. XII., 1872..116-118.

Fibro Vegetation of the great Australian Bight.
Journ. of Botany. IV., 1866..120-121.

On the production of Furfurol by the action of superheated water on wood.
Chem. News XXVI., 1872..247.

Müller, Johann., 50

Muller, N. J. C. 2.

——, 3

——, 13

Munro. (Maj. Gen.) Wm., 6.

Spectro-scope. The fluorescent spectrum of the electric light.
Annalen Phys. Chem. CXXX., 1867. 137-140.
Annales de Chemie XIII., 1868. 465-468.

Fibre. Investigations on the distributions of resins, etherial oils, gums, and gum resins and the position of the secretory cysts in plant substance.

a. The relative positions of the secretory canals to the fibres.
Pringsheim, Botan V., 1867. 422-439.

On the changes of the volume of solid bodies in consequence of the formation of the chemical compounds of the same condition of aggregate.
Annal. Phys. Chem. CLXIX., 1873. 33-44.

A monograph of the Bambusaceae, including descriptions of all the species [1866]
Linn. Soc. Trans. XXVI., 1870. 1-158

On the botany of Jamaica. [1872]
do., XIII., 1873. (Bot.), 331-332.

Myers, Jacob. S.

Nippoldt, W. A. & Kohlrausch, F.

Nitsche, Franz.

Nystrom, John. W.

Furnace On the regulation of gas flames for temperatures higher than the boiling point of quicksilver.
Deutsch. Chem. Gesell. Ber. V, 1872.. 859-860.

Meter On the value of Ohm's law for electrolytes, and a numerical determination of the resistance of dilute sulphuric acid by alternating currents.
Phil. Mag. XL, 1870.. 227-229.

" On Glycerin
Dingler, Polyt. Journ. CCIX., 1873..145-151.

Dyna-mos. On the Dynamometer at the Royal Technological Institute, Stockholm.
Franklin Inst. Journ. XLIX, 1865.. 392-94.

Obermann, J.

Odling, Wm., 37

Offret, J.

Ollivier, Auguste, 3.

O'Neill, Chas., 6.

————, 7

————, 8

Fluor-escence Remarks on fluorescence.
Annal. Physik. Chem. CXLIII., 1871.. 660

Catalysis On the occlusion of gases by metals. 1862
Roy. Institute Proceed. V., 1869.. 159–163.

On illumination from an economic standpoint.
Douai, Mem. Soc. Agric X., 1871.. 129-156.

Mercury Contributions to the history of acute mercurial poisoning.
Archiv. de Physiol. V., 1873.. 547-557.

Fibre On the tensile strength of cotton as affected by various chemical treatments.
Manchester, Phil. Soc. Mem. II., 1865.. 389-394.

" On an apparatus for measuring tensile strength, especially of fibres. [1863]
do. II., 1865.. 389-394.

" Experiments and observations upon cotton
do., Manchester, Lit. Phil. Soc. Mem. II., 1866. 394-421.

Ott, Adolph, 5

Paalzow, A., 10.

Paget, J. Arthur, 3.

Parry, John ; 1.

——, 2.

[On the nature and distribution of gold in metallic sulphides.
Franklin Inst. Journ. LVII, 1869 .. 128-133]

Meter On the galvanic resistance of liquids.
Berlin. Monats. bericht. Akad. 1868 .. 486-491.
Annales de Chemie. XVII., 1869 .. 502.

Loops On Saxby's method of testing iron with magnetism, to find pores, veins &c. Trans.
Dingler, Polytech. J. CLXXXVII., 1868 .. 43-48.

Catalysis On the gases contained in coke, and on the application of the Sprengel pump to the analysis of coke.
Chemical News. XXV, 1872 .. 98-100

Vacuum Estimation of carbon in pig iron, wrought iron, and steel by combustion with oxide of copper in vacuo under the Sprengel pump
do, 1872 .. 301 - 302 ..

Parry John, 6.

Parville, H. de.

——, 2

Patterson, T.L.

Pavio, Ambrogio.

Catalysis Gases occluded in pig iron, steel, and wrought iron.
Iron & Steel Journ. I., 1873.. 429-432.

Dynamo: Remarks relative to a new electric generator or continuous electrophorus recently described by Bertsch.
Comptes Rendus, LXIII., 1866.. 881-882

E. Light Note on an electrophoric multiplier with continuous discharge.
do. LXIV., 1867-40-42.

Furnace On a method for obtaining a continuous current of air or gas under pressure, for blowpipe or other uses.
Glasgow, Phil. Soc. Proc. VII., 1871.. 323-326

Aeronautics The production of hydrogen for use in aeronautics.
Milano Ist. Lomb. Rendiconti V. 1872
1080-1082, 1139-1140.

Payen, Anselm, 160.

——, 162

——, 166

——, 171

——, 175

Pellerin, A.

Rubber On the porosity of caoutchouc relatively to the dialysis of gases.
Comptes Rendus, LXIII, 1866, 533-537.

Fibre Structure and constitution of ligneous fibre.
do., LXIV., 1867.. 1167-1174.

" Tissue or web of cellulose extracted direct from the epidermis.
Comptes Rend. LXVI., 1868..509-513

Wood On the preservation of wood.
Annal. Conduct. Ponts Chauss XV., 1871.. 176-181, 222-227.

" Development of vegetable cellulose, and ligneous fibre &c.
Comptes Rend. LXXII., 1871..457-464.

Dynamos. Note on Siemens bobbin.
Comptes Rendus, LXXVII., 1873.. 561-562.

Pelouze, E. and Audouin, P.

Penaud, Alphonse. 2

Peters, Ed., 12.

Pettigrew, James Bell, 7.

———, 9.

———, 11.

Vacuum New process of condensation of liquefiable matters held in suspension by gases.
Comptes Rend. LXXVII., 1873. 264-268

Aero-nautics Law of forward motion in air.
Aeronaut. VI, 1873.. 4-18

Catalysis On the absorption of gaseous ammonia by solid bodies.
Dresden, Landwirth. Versuchs. III., 1861.. 105—107.

Aero-nautics. On the various modes of flight in relation to aeronautics
Roy. Instit. Proceed. V., 1869..94-107.

" On the mechanical appliances by which flight is attained in the animal Kingdom.
Linn. Soc. Trans. XXVI., 1870..197-278.

" A new form of propeller for water and air.
Aeronaut. Soc. Reports. VI, 1871.. 45-48

Pettigrew, Jas. Bell, 12.

Peyré, J. M. M., 3.

Peyronnie — de

———, 14.

Phillips, John Scott.

Aero-nautics. On the physiology of wings: being an analyses of the movements by which flight is produced in the insect, bat and bird.
Edinb. Roy. Soc. Proceed. VII., 1872.-336-350.

Dynamos. On experimental electrodynamics [1840]
Seine et Oise Mem. II., 1842.-137-160

Aero-nautics. Navigation in air. (Why relatively heavy birds have large wings and fly slowly, while the contrary is the case with small ones.)
Les Mondes XVII., 1868.-194-195.

Fibro. Contributions to a knowledge of the structure of the epidermis of plants.
Pringsheim Jahrb. Botan. VII., 1870.-532-567. also -
VIII., 1872.-16-74.

Aero-nautics. On artificial flight.
Aeronaut. Soc. Rep. 1867.-42-50

Phillips, Samuel E., 6.

Phillips, W. H.

Phipson, T. L., 71

Pick, Herrmann, 8

Pierre, Victor, 16.

Pierre, 17.

On a simple method of constructing high electrical resistance.

Phil. Mag. XL., 1870.. 41.

Aero- On aerial locomotion by machinery, without nautics. gaseous buoyancy.

Aeronaut, Soc. Report VI., 1871.. 53-54.

[On the magnetization of some minerals.

Paris. Bull. Soc. Chim. VII., 1867.. 322. also see. 321-322

Meter On electrolysis in the service of telegraphy.

Wien, Schriften, VI., 1867.. 1-38

Contributions to the question of the correct estimation of the net available effect of electromagnetic -motors.

Dingler Polytechn. Journ. CXC., 1868.. 1-12

Dynamos Kravogel's electromagnetic motor.

Wien Akad. Sitzungsb LVII., 1868 (Abth. 2.) 532-547.

Carl, Repertorium, V. 1869., 14-29

Pillet, Louis, 5.

Planté, Gaston, 3

——— + Niaudet-Breguet, A.

Plücker, Julius, 69

———, and Hittorf, J. W.

Poggendorf, J. C. 141.

Aero-nautics. Practical experiments on the return of different aerial helices, and description of the helix with concavo-convex surfaces. Aeronaute, III., 1870 – 33–43.

Meter Note on a phenomenon observed in a voltameter of copper wires and acidulated water. Archiv. Sci. Phys. Nat. VII., 1860. 332–334.

On an electrodynamic experiment. Comptes Rend. LXXVI., 1873. 1259–1261.

Meter On the heating action of an electric current. Comptes Rend. XXVI., 1848. 227–228.

Spectro-scope On the spectra of ignited gases and vapors, with especial regard to the different spectra of the same elementary gaseous substance. Roy. Soc. Proc. XIII., 1864. 153–157.

On the influence of two induction machines on each other. Annal. de Phys. et de Chemie. XIII., 1868. 442–443.

Poggendorf, J. C., 142.

———, 148

———, 161

Popp, Otto, 14

Preston, S. Tolver.

Prime, Fredrick

Dynam On electric rotation.
Annal. Phys. Chem. CXXXI., 1867..655-656

" On a new electrical motion.
Annal. Phys. Chem. CXXXI., 1867..635-643

On the question how nonconducting substances are influenced.
do. CXXXIX., 1870..458-464.

Fibre On the composition of the sugar cane.
Zeitschr. fur Chemie VI., 1870..329-330

Dynamo On the direct conversion of dynamic force into electricity.
Phil. Mag. XLII., 1871..53-55.

On the direct conversion of dynamic force into electricity.
Phil. Mag. XLII., 1871..53-55

Luckow's method for the determination of copper and some other metals

Procter, Richard, A.. 47.

Prony, - and Morin (General)

Provenzali, Francesco S., 3

———, 9

Pugo, (l'abbe) Th. L., 2

Quincke, G., 27.

Aeronautics - On the resistance of planes caused to traverse the air.

Aeronaut. Soc. Report, VI., 1871.. 6-8.

Dynam. On the transmission of force by belts & pulleys

Journ. Frank. Inst. LV., 1868.. 17-28

Photometer - Action of light on a solution of iodine in bi-sulphide of carbon: a new photometer with constant indications.

Roma, Atti Nuovi Lincei, XXIV., 1871.. 138-139.

Dynamo. Description of a dynamo ~~electro~~ magnetic machine.

do., XXV., 1872.. 131-137.

Aeronautics. Aerial navigation.

Les Mondes XIV., 1867- 189.

On the transportation of matter by the electric current.

Annal. Phys. Chem. CXXXI., 1867. 159.

Quincke, G., 36.

Rankin, Jas.

Rankine, Wm J Macquorn, 112.

Raoult, François M., 7.

——, 12.

——, 17.

Meter On electrolysis and electric conductivity through fluids.
Annal. Phys. Chem. CXLIV., 1872..1-33
161-190. = Phil. Mag. XLIII., 1872..369-375, 518-525
XLIV., 1872..261-291.

Aero-nautics On the flight of birds.
Cardiff Nat. Soc. Trans. 1., 1867-68., 56-67

Fibro On the tenacity of some fibrous substances.
Glasgow. Trans. Inst. Eng. IX., 1866. 29-36.

Meter Thermic researches on the voltameter.
Comptes Rend. LIX., 1864..521-524.
Phil. Mag. XXVIII., 1864..551-554.

Loops Condensation in nickel of nascent hydrogen.
do., LXIX., 1869-826-827.

Meter On the apparent substitution of metals for themselves in their saline solutions.
do., LXXVI., 1873..156-157.

Rayleigh, (Hon. J. W. Strutt), Lord. 17.

Raynaud, J., 10

Reda. St Martin, Henri

Redslob, —

Regnault, Victor, 82

Dyna-mos. An experiment to illustrate the induction of a current on itself.
Nature, VI., 1872.. 64

" On the conditions of maximum magnetic effect in galvanometers and electromagnets
Comptes Rend., LXXVII., 1873.. 1303-1304.

Aero-nautics. A projected experiment in aerial locomotion.
Aeronaut. Soc. I., 1866- 46-49

" Description of a new aerostatic apparatus.
do., II., 1867.. 23-24.

" A novel apparatus for aerial locomotion
do., 1867.. 58-62.

Dynam. On a volta-faradic apparatus.
Comptes Rend. LXVII., 1868.. 530-531

Sensible tension of the vapor of mercury at low temperatures.
Comptes Rend. LXXXIII., 1871.. 1461-1463

Ruchardt, E. 10

——, 17.

Reinsch, Hugo, 52.

Reitlinger, Edmond., 11.

——, and Kuhn, M.

Reynard, N. A.; 6.

Catalysis On the determination of gases absorbed by solid bodies.
Chem. Centr. Blatt, XI., 1866.. 753-765, 769-773.

" Investigation of solid bodies for gases.
Fresenius, Zeitschrift, VII., 1868.. 184-187.

Dynamo Simplified electro magnetic apparatus.
Repert. für Pharm. 1, 1848.. 1-18

— On the sources of light.
Wien. Schriften .. II., 1863.. 45-68

Vacuum On the spectra of negative electrodes and
Geiss' Light long used Geissler tubes.
Annal. de Chem. XXV., 1872.., 219-220

Dynamo Establishment of the fundamental formu-
:las of electro dynamics in the hypothesis of a single fluid (See also No 5.)
Comptes Rendus. LX, 1865.. 110

~~Bernard~~,
Renault, Bernard., 10

Reusch, E. 23

——, 28

Reynard — 1, 2, + 3.

Riecke, Edward, 7

Rieman, [G. F.] Bernhard, 13.

Meter Experimental verification of the reciprocal of Faraday's law on the decomposition of electrolytes.
Annales de Chem. XI., 1867. 137-193.

Insulation On guttapercha.
Annales de Chem. XV., 1868. 506-507.

Fibre On a peculiar break experienced by wood under pressure in the direction of its fibre.
Württemberg: Jahreshefte., XXV., 1869. 35-38.

Dynamo. On the mode of action of electrodynamic and magnetic forces.
Comptes Rend. LXIX., 1864. 959.

Dynamo. Remarks on the polar point of a magnet. (Scales 2, 3, 4, 5 + 6.
Annal. Phys. Chem. CLXIX. 1873. 62-73.

" A contribution to electrodynamics.
Phil. Mag. XXXIV., 1867. 368-372.

Reiss, P. J.

Rigg, (Rev.) Arthur.

Röber, A., 3.

Roberts, Wm Chandler, 3.

——, and Wright, C. R. A.

Robinson, George

Dyn-amos. On electric valves.
Annal. Phys. Chem. CXXXVI., 1869. 31-50

Meter. On the energy of electricity with especial reference to the measurement and utilization of it.
Telegraph. Journ. I., 1872-73. 265-268.

Dyna-mos. On the law of magnetisation of soft iron.
Annal. Phys. Chem. CXXXIII., 1868. 53-56

Clamp Loop. On the absorption of hydrogen by electro-deposited iron.
Brit. Assoc. Rep. XL., 1870 (Sect.) 62.

On the condition of the hydrogen occluded by palladium &c.
Chem. Soc. Journ. XI., 1873. 112-123

[Certain undescribed properties of the concentrated solar rays.
Pharmaceut. Journ. III., 1873. 463-465]

Roget, Gustave & Jamin, J. 1

——, 2

——, 4

Rogers, Wm. B. 38

Romilly-de.

Röntgen, W.C., 3.

Rood, Ogden. N. 22.

Dynamos. On the light of the magneto electric machine.
Comptes Rendues. LXVI.,

" On magneto-electric machines
Phil. Mag. XXXVI., 1868.. 235-238

" On the heat developed in interrupted currents.
do., XXXVIII., 1869.. 166-168

A Light Photometry. Electric illumination at Boston. Photometrical powers of the light. (See No. 39)
Amer. Journ. Sci. XXXVI., 1863.. 307-308

Dynamos. On a magneto electric machine.
Comptes Rendues LXXIII., 1871.. 726-729.

Glass. On the soldering of platinized glass
Annal. Phys. Chem. CL., 1873.. 330-333

Description of a photometer.
Amer. Journ. Sci. XXXVI., 1863.. 60-64

Rood, Ogden., 25.

———, 32. + 33

Roscoe, Henry Enfield. 33

Rosenthal, J., 11

Ross, Donald.

Photometer. On the combination which takes place when light of different tints is presented to the right and left eye.
Amer. Journ. Sci. XXXIX., 1865. 254-259

". Photometric Experiments.
Amer. Journ. Sci. XLIX., 1870. 145-152.

" On a self recording method of measuring the intensity of the chemical action of total daylight (See three next articles)
Roy. Soc. Proceed. XXII., 1873-74. 158-159

Fibre On plants that furnish paper.
Breslau, Jahresber. Schles. Gesell. XLIII., 1865. 87-89.

[On a floating tidal motive power and machinery.
Edinb. Scot. Soc. Arts. Proceed. VII., 1868. 96-97.]

Roth, Raymund.

Rouvre, Charles de, and Bellet, P. L.

Rouyer, Victor Léandre

Rowland, Henry A. 3.

Rudorf. Fr., 11

Rühlmann, Richard, and Wiedemann, G.

Loop Coating On the limit of perception in some chemical reactions.
Repert. für Pharm. XLVII., 1834. 354-382.

Dynamo Note on a new system of electromagnetic locomotive.
Paris. Mém. Ingén. Civil. 1865. 363-375

" Note on the electric locomotive of Messrs. Bellet & de Rouvre. (above)
do., 1865. 376-390.

" On the magnetic permeability and the maximum of magnetism of iron steel & nickel
Amer. Journ. Sci. VI., 1873. 416-425

Meter On the freezing of solutions of salts (see 7.)
Annal. Phys. Chem. CLXV., 1872 599-622

Vacuum Geiss^e Light. On the passage of electricity through gases.
Annal. Phys. Chem. ~~CLXV~~ CXLV., 1872. 235-259. 364-399.

Rumford, Benj. (Count.), 44.

Ruprecht, Franz. Joseph. 24

Rutt, Walter

Sabine, Robert, 4

Sacc, F., 53

Saikowsky, (Dr.)

Researches on the source of light manifested in the combustion of inflammable bodies.
Bibliotique Brit. LIV., 1863.. 3-26.

Fibre On some new Brazilian bamboo canes.
St. Petersburg Acad. Sci. Bull. VIII., 1841
332-336.

Aero-nautics. The flight of birds considered with reference to aerial navigation.
Adelaide Phil. Soc. Trans. 1872.. No 2.

On a normal resistance thermometer.
Telegraph Engineers' Journal. 1, 1872-73,
414-418.

Fibre Studies on cotton.
Annal. Genie Civ. 1., 1872. 324-333

Mercury On some changes brought about by Quick-silver in the animal organism.
Virchow, Archiv. XXXVII., 1866. 346-350.

Saint Edme, Ernest, et L Holz, L.

Saint Loup, L.

Sainte Claire Deville, Charles Joseph, 48.

Sainte Claire-Deville, Henri. 69 7.

———————, 72, 74, 76.

———————, 81

Loup On the generation of ozone in oxygen and in air influenced by the electric spark.
Comptes Rend. LXVII., 1868.. 620-623.
Phil. Mag. XXXVII., 1869.. 79-80.

Dyn-amos. Experimental study of the attraction exercised by a bobbin on a bar of soft iron.
Paris. Ecole Norm. Annales. VII., 1870.. 181-209.

Clamps Glass On the passage of gases across solid, homogeneous bodies.
Comptes Rendues. LIX., 1864.. 102-107

" Note on the passage of gas across solid homogenous bodies.
Journ. de Pharm. XLVI., 1864.. 96-103

Loops On the phenomena of dissociation in homogenous flames.
Comptes Rend. XL., 1865.. 884-891

" On dissociation.
do., XLIV., 1867.. 66-74.

Sainte Claire-Deville, H., 88

——, 96

——, 97

——, 98.

——, and Wöhler F.

Sale (Lieut.)

Salet, Georges, 2.

Loop On the nascent state.
Comptes Rend. LXX., 1870-20-26, 550-557.

" Experiments on dissociation and change of state.
Journ. de Phys. I., 1872-26-29.

Photometry. Calorimeter. On the measure of very high temperatures and on the temperature of the sun.
Comptes Rend. LXXIV., 1872-145-152.

Loop. Report on a Memoir of Troost & Hautefeuille on isomeric and allotropic transformations.
do., LXXVI., 1873-1175-1182.

Note on graphitoidal boron.
do. LXIV., 1867-19-20

[The action of light on the electrical resistance of selenium.
Roy. Soc. Proceed. XXI., 1873-283-285]

Loop Affinity and electricity.
Laboratory I., 1867-248-250

Salm. Horstmar (Prince of), 40

——, 41.

Sarasin, Edouard.

——, and Delarive

Saxby. S. M.; 2.

Saxton. Joseph. 4

Clamps. Experiments on melting of ice by concentrated Catalysis sun rays.
Annal. Phys. Chem. CXXII., 1864. 189-190.

Loop On the elevated heat radiation of a platinum plate coated with carbonate of soda.
do., CXXIII., 1864. 653-654.

Vacuum On the phosphorescence of rarified gases after Geiss. Light the passage of the electric discharge.
Phil. Mag. XLII., 1871. 211-223.

" On the action of magnetism on gases traversed by electrical discharges. (See 23+4)
do. XLII., 1871. 211-223.

[On testing iron by magnetism
Naval Architects Trans. IX., 1868. 61-78]

Dynam. Notice of electro magnetic experiments.
Amer. Journ. Sci. XXII, 1832. 409-410.

Saytzeff; Michael

Schär, Eduard. 2.

Schellen, H.

Schmidt Werner, 5.

Schneebeli, Heinrich. 7.

Schneider, Gustav. 4.

Catalysis On the action of the hydrogen absorbed by palladium on some organic compounds.
Journ. Prakt. Chem. CXIV., 1873. 128-135

Loop On a new ozon compound of organic nature.
Bern. Mittheil. Naturf. Gesell. 1867. 3-15

Dynamo Dynamo-electrical machines.
Carl, Repertorium. IV., 1868. 65-88.

Polarization of ~~heat~~ oxygen by heat.
Basle, Verhand. Naturf. Gesell. IV., 1867. 605

Meter. Determination of the horizontal component of the earths magnetism by the chemical way.
Annal. Phys. Chem. CXLIV., 1872. 640-643

On motors (electro?)
Dresden Sitzungsber. Isis. 1873. 52-54

Schönbein, 339 C. F.

———, 359.

Schöne. Emil, 9.

Schultz, Carl, 2.

Schunk, Edward, 26.

———, 28

Loop On the production of active oxygen by slow oxydation of volatile organic material.
Journ. f. Prakt. Chem. XCVIII., 1866..280-283

Loop On the relation of some organic substances to ozone.
do., CV., 1868..230-232.

Loop On the relation of ozone and water to eachother.
Fresenius Zeitschr. VII., 1868..29-47
Annal. Chem. Pharm. CLXXI., 1874.87-109

Vacuum On the conditions of the discharge of electricity in rarified air.
Annales de Chemie. XVI., 1869..479-481.

On some constituents of cotton fibre
Manchester Lit. Phil. Soc. Proc. VII., 1868-91-97.

On the chemical composition of cotton.
Brit. Ass. Rep. XL., 1870 (Sect.) 63.

Schwedoff, Theodor.

Schwendler, Louis, 4.

Scott, John (of Tain)

Secchi. Angelo, 241.

——, 247

Insulation On the importance of insulation in electrical matters.

Annal. Phys. Chem. CXXXV., 1868. 418-437, 495-496.

do., CXXXVII., 1869 - 559-569.

" On a practical method for detecting bad insulators on telegraph lines.

Phil. Mag. XLII., 1871 - 103-107

Clamps Loops On the burning mirrors of Archimedes, with some propositions relating to the concentration of light produced by reflectors of different forms.

Edinb. Roy. Soc. Trans. XXV., 1869. 123-150

Researches on the electric current and its analogy with hydraulic phenomena.

Roma Atti. Nuovi Lincei, XVII., 1864 - 219-231:

Les Mondes V, 1864. 579-581

Dynamos Magneto electric researches

Roma, Bull. Meteorol. III., 1864. 25-26, 33-35, 41-42.

Secchi, Angelo, 313

——, 375

Séguin, Sr. 34

——, 35

Seguin, J. M. 16

——, 17

On the transparence of red hot iron.
Comptes Rendues, 1867.. 778-779.

Vacuum, On the composition of the solar aureola,
Geiss Light and on some peculiarities offered by rarified gases, when they are rendered incandescent by electric currents.
do., LXX, 1870. 79-84

Memoir on the causes and effects of heat, light, and electricity.
Cosmos. II., 1865.. 731-843

Memoir on 'aviation' or aerial navigation.
do., III., 1866.. 334-352

Photometry. On the employment of the spectroscope to distinguish a feeble light from a stronger one.
Phil. Mag. XXXVIII., 1869.. 325-326

Vacuum Platinum Reply to a note of M. E. Fernet on the bluish light which an induced discharge causes at the end of a platinum wire.
Comptes Rend. LXIX, 1869.. 196.

Seidel, Ludwig, + Leonhardt E.

Serré, — + Morisot, —

Sheward, Richard

Shortrede, (Genl.) R.

Siemens, Charles William, 19

Photometry. Measurements of the light from two hundred and eight fixed stars.
München Akad. Abhand. X., 1870: 201-317

Loops. Facts relative to the decomposition of bodies by the pile, and to ozone.
Bordeaux, Mém. Soc. Sci. (IV, cah. 2.) 1866. 4-7.

Aeronautics. Construction of an aerial machine.
Aeronaut. Soc. Report. IV., 1869.. 33-34

On the depression of the barometric column by the vapor of mercury.
Astron. Soc. Monthly Not. XXVI., 1866, 307.

Dynamos. On the conversion of dynamical into electrical force without the aid of permanent magnetism.
Roy. Soc. Proc. XV., 1867.. 367-369

Siemens, Charles William, 29

Siemens, Werner, 15

——, 17.

Simpson, Maxwell, 14.

Loop On the increase of electrical resistance with rise of temperature, and its application to the measure of ordinary and furnace temperatures. [Bakerian Lecture] Roy. Soc. Proc. XXX, 1871., 443-445

" On measuring temperatures by electricity. do., VI., 1872.. 438-448.

Dyna-mos On the transformation of work into electricity current without the employment of permanent magnets. Annal. Phys. Chem. CXXX., 1867.. 332. 335

A direct method of determining battery resistance. [1873] Telegraph Engineers Journal. 1, 1872-73 407-410

Filre On the action of chloride of ~~nitrogen~~ iodine upon organic bodies. Roy. Soc. Proc. XIII, 1864.. 540-541

Sinsteden, W., 12.

——, 13.

Sirks, J. L., 3.

——, & Aronstein, L.

Skey, Wm., 4.

Dyna-mos How can the induction currents be prevented in an electro-magnetic motor, which arise under the rotation of a movable magnet and which weaken the battery current and prevent the full working of the Machine?
Annal. Phys. Chem. CXXXVII., 1869..483-487.

" On the action of the dynamo-electric induction apparatus and Wheatstone's crosswire in the same.
do., Erg. band, V., 1871..648-653

[On the refraction and dispersion of Selenium.
Annal. Phys. Chem. CXLIII., 1871..429-439]

Rubber On the diffusion of gas through caoutchouc.
Phil. Mag. XXXII., 1866..320

Fibre On the effect of ammoniated solution of copper upon vegetable fibre.
Chem. News XV., 1867..1

Skey, Wm., 33

Smallwood, Charles, 14

Smith, H. F.,

Smith, Wm. Robertson, 3

Smith, Willoughby, 2

Smyth, John, Jr.

[On the conducting power of various metallic sulphides and oxides for electricity as compared with that of acids and saline solutions.
Chem. News, XXIII., 1871.. 181-182]

Loops On ozone.
Canadian Naturalist, III., 1868.. 374-387.

Glass On the action of hydrofluoric acid on glass view microscopically.
Monthly Micros. Journ. VII., 1872.. 14-15

Loop On the flow of electricity in conducting surfaces.
Edinb. Roy. Soc. Proc. VII., 1872.. 79-99

[Effect of light on selenium, during the passage of an electric current.
Amer. Journ. Sci. V., 1873.. 301.
Nature, VII., 1873.. 303, 361.]

On the Ozonometer for the observation of ozone, with an Aspirator, instruct. for use & results.
Brit. Meteoro. Soc. Proc. IV., 1869.. 375-387

Smyth, Dr. W.

Sorel, —

Soret, J. L., 17. see 19.

—, 18

—, 19

Aero-statics Experiments practically demonstrating the laws by which birds fly, and their application to an aerial machine.
Aeronaut. Soc. Report, II., 1867 — 32-40

Principle of a new aerostat that may be directed.
Comptes Rend. LXXI., 1870 — 729-731

Meter Verification of the electrolytic law when the current exercises an exterior action.
Archives Sci. Phys. Nat. XX, 1864. 324-337
Phil. Mag. XXVIII., 1864 — 563.

Shaw's Gauge Researches on the density of ozone.
Annal. de Chem. VII., 1866 — 113-118

E. Light Researches on the correlation of dynamic electricity and the other physical forces. 4th Memoir. Verification of the electrolytic law when the current exercises an exterior action.
Genève, Soc. Phys. Mém. XVIII., 1866. 129-148.

Soret, J. L., 33

Southwell, Thomas., 2:

Spencer, Herbert., 5

Dyna-mos. On the induction currents produced in the bobbin of an electro magnet when a metallic mass is put in motion between its poles

Comptes Rend. XLIV., 1872.. 546-528.

Aero-statics On the flight of birds.

Norfolk, Nat. Soc. Trans. 1869-70.. 41-59

Wood On circulation and formation of wood in plants.

Linn. Soc. Trans. XXV., 1866.. 405-430

Aero-nautics, statics Particulars of experiments made in Jan. 1846; to ascertain the law of resistance to the passage of air through pipes of different diameters and lengths at various velocities.

Aeronaut. Soc. Report, VI., 1871.. 15-24

Fibre On the discrimination of fibres in mixed fabrics.

Chem. News. XXII., 1870.. 169-170

Spottiswoode, Wm, 46.

Sprengel, Hermann, 4

——, 6.

~~Stephan~~
Stefan, J., 32

Stefanelli, Pietro, & Mangoni, C.

Stevenson, Thomas, 18.

[On the old and new laboratories at the Royal Institution.
Roy. Instit. Proceed., VII, 1873.. 1–11.]

Vacuum Researches on the vacuum.
Chem. Soc. Journ. III., 1865.. 9-21

On the history of the water air pump.
Phil. Mag. XLV., 1873.. 153-154

Dyna-mos. On the fundamental formulae of electrodynam-ics
Wien, Akad. Sitz. ber. LIX., 1869. (Abtheil. 2.,) 693-769.

Meter On the influence of certain liquids in retarding or arresting the actions of acids upon metals. (Transl.)
Chem. Soc. Journ. X., 1872.. 116

Notice as to the illumination of beacons at sea by electricity communicated through wires connected with the shore.
Edinb. Scot. Soc. Proc. Arts Trans. VII., 1868 306-309

Stevenson, Thomas. 21.

Stewart, Balfour. 35

——, and Tait, P. G. 2

Stoddard, O. N., 6.

Stokes, G. G., 80

Stoletow, A.

Lamps Description of a paraboloidal reflector for lighthouses, consisting of silvered facets of ground glass; and of a differential heliophoto.
Brit. Ass. Rep. XLI., 1871. Sect., 37–38.

On radiant light and heat.
Quart. Journ. Sci., 1864. 589–598.

[On the heating of a disc by rapid rotation in vacuo.
Roy. Soc. Proc. XIV., 1865–339–343]

The nature of electrical discharge.
Amer. Ass. Proc. XVII., 1868. 113–118.

Loop On the communication of vibrations from a vibrating body to a surrounding gas...
Phil. Mag. XXXVI., 1868. 401–421

Dyna-mos. On the magnetising function of soft iron &c
Phil. Mag. XLV., 1873. 40–57

Strauss, (Prof.)

Streintz, Heinrich, 2

Struve, Heinrich., 24

Tait, P. G., 38

Tangl, Edward.

Tate, Thomas., 18.

On the relation of the fatty oils to gases.
Repert. für Pharm. II, (1828-2nd Ed.) 1818..
125-144

Loop On the change of elasticity and length in a wire traversed by a galvanic current
Annal. Phys. Chem. CL., 1873.. 368-380

Studies on Ozone &c.
Fresenius Zeitsch.. X., 1871.. 292-298

Meter. Note on electrolytic polarization..
Phil. Mag. XXXVIII., 1869.. 243-246

Fibre Contributions to the knowledge of the perforations in plant vessels.
Wien, Akad. Sitzungsb. LXIII., 1871.. 537-548; LXVII., 1873.. 79-92.

Mercury On the magnitude of a drop of liquid
Vacuum formed under different circumstances.
Phil. Mag. XXVIII., 1864.. 176-180

Terquem, A., 12.

Tessié du Mothay –, + Maréchal C.R.

Than, Carl von, 6.

Thenard, Arnould, 3.

— —, 5.

Thomas, Pierre.

—, 3.

Loop Experiments to demonstrate that electricity carries to the surface of bodies.

Journ. de Physique, 1., 1872 .. 29-30

Globes Glass. Chemical production of dull engraving on crystal and glass.

On the formation of ozone in quick combustions

Journ. Prakt. Chem. CIX., 1870-415-420

Globes On an apparatus fitted to submit gases and vapors to the electric effluvium.

Comptes Rend. LXXV., 1872 - 118-120

New researches on the electric ~~efflemom~~ effluvium.

do., LXXVI., 1873 - 1508 - 1514

Rubber Contraction of caoutchouc by heat. (ai 2..

Les Mondes XIX, 1869 .. 575 - 579

Elementary considerations on the theoretic of aerial navigation.

Aeronaute V., 1872 .. 25-31

Thomsen, Julius, 8.

———, 35

Töpler, August, 6.

Trannin, H.

Tremau de Rochebrune, Alphonse, 8

The mechanical equivalent of light.
Phil. Mag. XXX, 1865. 246–249

The affinity of hydrogen to chlorine, to oxy-gen and to nitrogen.
Deutsch. Chem. Gesell. Ber. IV., 1871. 941–947.

Catalysis Adhesion of gases to solid and liquid bodies.
Riga, Corrispondenz Blatt XV., 1866. 42–43

Note on a process for measuring the relative intensity of the constituent of the different sources of light.
Comptes Rend. LXXVII., 1873. 1495–1497

Fibre On the manufacture of Chinese and Japanese papers, and on the vegetables em-ployed in this manufacture.
Paris, Bull. Soc. Bot. France XII., 1865, 303–307.

Trive, (Capt.) A., 2.

Trives, Michele, 1.

Toscano, Caesaro., 10

Tribe, Alfred, & Gladstone, J. H., 4

——, 7.

Dynamos. Study of electromagnetic machines.
Revue Marit. XXIII., 1868..951..961.

Dyna-mos. On the magnetism developed by induction in bars of steel. (see 2.)
Comptes Rend. LXVII., 1868.. 321

Fibro Result of an analysis of the gas which occupies the vessels, fibre and intercellular spaces of plants.
Revista Scientif. 1., 1869..87

Meter On the mutual helpfulness of chemical affinity, heat and electricity in producing the decomposition of water.
Brit. Assoc. Report. XLII., 1872..(Sect.), 75-77

" Researches on the action of the copper-zinc couple on organic bodies. (see 9 and 10.)
Chem. Soc. Journ. XI., 1873..445-452

Troost + Hautefeuille, P. 12.

Tyndall, John., 83

———, 102.

———, 112.

Ulgren, Clemens

Valson, C. Alph., 6.

Spectroscopy. On the spectrum of carbon &c.
Comptes Rend. LXXIII, 1871. 620-622

On combustion by invisible rays.
Phil. Mag. XXIX., 1865. 241-244

On a new series of chemical actions produced by light.
Roy. Soc. Proc. XVII, 1869. 92-102

[On the identity of light and radiant heat.
Roy. Instit. Proc. VI., 1872-417-421]

Mercury. On cleaning of Quicksilver [1863]
Skand. Naturforsk. Forhandl. IX., 1865. 241-243.

Loop Study of molecular action founded on the theory of capillary action.
Annales de Chemie. XX., 1870. 361-391, 1040-1043

Varley, Cromwell, F., 5

——, 7

——, 8.

Vetillard, —.

Dynamos. On certain points in the theory of the magneto-electric machines of Wilde, Wheatstone & Siemens.

Roy. Soc. Proc. XV., 1867..403-404

Meter Polarization of metallic surfaces in aqueous solutions. On a new method of obtaining electricity from mechanical force &c.

Phil. Trans., CLXI., 1871..129-136

Vacuum Some experiments on the discharge of electricity through rarified media and the atmosphere.

Roy. Soc. Proc. XIX., 1871..236-242

Fibre Of the vegetable filaments employed in industry, characteristics permitting their being distinguished from each other.

Comptes Rend. LXVI., 1868..896-901

Vierordt, Karl., 37

Villari, Emilio, 6

——, 12.

Vogel, Dr, + Reuschauer, Dr,

Vogel, Hermann.

Voller, August.

Photometry — Description of a photometric method for measuring and comparing colored light.
Annal. Phys. Chem. CXXXVII, 1869 220-222

Rubber — On the heat developed in caoutchouc as the effect of traction.
Milano, Ist. Lomb. Rendiconti II, 1869. 767-771

Dynamos. — Study of some phenomena of electrodynamic induction.
do., IV., 1871, 25-34.

On the alterations some kinds of glass experience under heat.
Cuyper, Revue Univ. VII., 1860. 151-158.

Photometry. — On a new photometer for determination of chemical strength of the light
Annal. Phys. Chem. CXXXIV., 1865. 146-152.

Meter — On changes of electromotive force of galvanic combinations, by heat.
Annal. Phys. Chem. CXLIX., 1873. 394-399.

Volpicelli, Paolo: 110

Vo———, 119

——— ———, 120

Wagener, J. A. von.

Wagner, Rudolf, 12.

Walenn, W. H. 5 + 7

Dyna mos. Determination of the poles of magnetised bars
Comptes Rend. XLIV, 1862. 1197-1200.

Geiss Light. On the causes of the luminous effects obtained by electric influence in rarefied gases inclosed in glass tubes.
Comptes Rend. LXIX., 1869. 730-733

[On the heat of lunar radiations
Comptes Rend. LXIX., 1869. 920-922.]

Dynamos. Result of the efforts made to make electromagnetism available as a motive power.
Wien Akad. Sitz. ber. LIII., 1866. (Abth. 2.), 308-325.

Mercury On the hydrometallurgy of Quicksilver.
Journ. Prakt. Chem. XCVIII., 1866. 23-26.

Metor On the electro deposition of copper + brass
Brit. Ass. Rep. XL., 1870. (Sect.) 67-68.

Wallis, Gustav,

Waltenhofen, A. von, 9.

——, 10

——, 11

——, 12.

Fibro Brazilian Guyana from a botanical point of view. [Trans.]
Belgique Horticole XXI., 1871-39-59.

Meter Observations on the polarity of constant batteries &c.
Wien, Akad. Sitzungsb. XLIX., 1864. (Abth. 2) 229-248.

Spectroscope Spectral analysis of the electric light.
Dingler Polytech. Journ. CLXXVII., 1865. 38-40

Geissler Light Some observations on the electric light in highly attenuated gases:
Wien. Akad. Sitzber. LI., 1865 (Abt. 2) 535-545.
Annal. Phys. Chem. CXXVI., 1865-527-539

Contributions to a knowledge of the mechanical action of Electricity.
Dingler Polytechn. Journ. CLXXIX., 1866-432-436.

Waltenhofen, A. von. 16.,

———, 20

———, 21

———, 22

———, 24.

Dynamos: On a new electromagnetic machine and on the determination of the availability and cost of running such machines in general.
Dingler Polytech. Journ. CLIII., 1867.. 417–434.

" On the limits of magnetisation of iron and steel.
Annal. Phys. Chem. CXXXVII., 1869.. 518–535.

" On the question of a proper estimation of the capacities of electro magnetic machines.
Dingler Polytech. Journ. CXCI., 1869.. 89–103.

" On the electromagnetic 'pull'.
Carl Repertorium VI., 1870.. 308–322

Insulation: On a simple apparatus for the determination of the magnetic relations of iron tubes.
Wien, Akad. Sitzungsb. LXII., 1870.. (Abtheil. 2) 438–440.

Waltenhofen, A. von. 25

——, 29

——, 30

Walz, Isidor, 2.

Wanklyn, J. Alfred, 53

Dynam-os. On the attraction which a magnetising spiral exercises on a movable iron core.
Wien Akad. Sitzungsb. LXII., 1870 (Abt 2). 791-796.

A Light On the production of the arc light by thermo-piles. (see 26. & 28)
~~Annal. Phys. Chem. CXLIII.~~,
Prag, Sitzungsb. 1872 (pt. 2) 6-9

Dynam-os. On a general theory for the calculation of the action of magnetising spirals.
Wien, Akad. Sitzungsb. LXVII., 1873. (Abtheil. 2) 417-432.

Mercury Note on the extinction and reducing power of mercury.
N. Y. Lyceum, Proc. I., 1870-71-18-20

Loop. On the continuous production of oxygen.
Brit. Assoc. Rep. XLII, 1872 - (Sect.) 85.

Warburg, Emil

Warren, Th. P. Bruce, 2

——, 9

Wartmann, Elie, 68

Weber, Fr., 2

Meter Observations on the influence of tempera-ture on electrolysis
Annal. Phys. Chem. CXXXV, 1868. 114-120.

" On the electrical resistance of the fixed and volatile oils.
Brit. Ass. Rep. XXXVII., 1867 (Sect.) 47-48

On the application of the calculating machine of M. Thomas (of Colmar) to electrical computations.
Tel. Engin. Journ. I, 1872-73.. 141-169

On the spontaneous reestablishment of the voltaic arc after an extinction of short duration.
Comptes Rend. 1868 LXVI., 155

Loop. Result of an investigation on the con-densation of gases on the surface of solid bodies.
Halle Zeit. Gesamt. Naturwiss. XL., 1872.. 189-190

Weil, Friedrich, 2

Weltzien, C., 28

———, 31.

Wenham, F. H., 17.

Wernicke, W.

Westphal, G., 2

Wetherill, Chas. Mayer, 20.

Loop. New process having for object the clothing of metals with an adhering brilliant layer of other metals
Annales de Chem. IV., 1865. 374-392

On hydrogen hyperoxide and ozone
An. Chem. Pharm. CXXXVIII., 1866. 129-164

On formation of ozone
do., CXLII., 1867. 107-110

Shades Globe. Light reflected from transparent surfaces
Quart. Journ. Micro. Soc. VI., 1866. 167-168

Globe On gilding glass for optical mirrors.
An. Phys. Chem. CXXXIII., 1868. 183-186

Meter On balances for determining specific gravity of fluids.
Ins. Zeitsch. IX., 1870. 233-236

Loop Ozone and antozone.
Smithson. Rep. 1864. 166-167

Wheatstone, Sir Charles, 31

Wiesner, Julius, 31.

Wilson, Robt. W.

Winter, G. K., 7.

Wolf, C., 14

Dy-namos. On the augmentation of the power of a magnet by the reaction thereon of currents induced by the magnet itself.
Roy. Soc. Proc. XV., 1867 .. 369-372

Fibre Contribution to a knowledge of the Indian fibre plants and the fibres separated from them, together with observations of the finer structure of bast cells.
Wien. Ak. Sitzb. XLII., 1870 .. 171-206.

Dyn-amos. Demagnetisation of electro-magnets.
Amer. Journ. Sci. III., 1872 .. 346-347.

" On the relation which the internal resistance of the battery and the conductivity of the wire bear to the maximum magnetizing force of an electro magnetic coil.
Phil. Mag. XLIV., 1872 .. 414-417.

Photo-metry. Photometric experiments.
Journ. de Physique. I., 1872 .. 81-87

Wright, C. R. A. & Roberts W. C.

Wright, R. J.

Wüllner, A., 26.

Yvon, P., 2.

Zettnow, Emil, 13.

Zollner, Fr., 11.

Cata-lysis. On the condition of the hydrogen occluded by palladium, as indicated by the specific heat of the charged metal.
Chem. Soc. Journ. XI., 1873. 112-123.

Photo-metry. On an easy method of measuring the intensity of daylight.
Roy. Soc. Proc. XVI., 1868. 525-526

Spectro-scope. On the spectra of some gases under high pressure.
An. Phys. Ch. CXXXVIII., 1869. 337-361.

Photo-meter. Photometer founded on the impression of relief.
Compte Rend. LXXV., 1872. 1102-1103

Vacuum. On crystallized Phosphoric acid.
An. Phys. Chem. CXLV., 1873. 643-644

Photo-metry. Some sentences on theoretical photometry.
An. Phys. Ch. CXXVII., 1866. 46-61.

Leblanc, Felix, 4.

Le Conte (Prof.) John, 4.

Lecount, Peter

Lefebvre, ——.

Lenssen, E + Löwenthal J., 2.

On the tendency to flexion and rupture of one surface while the other rests in contact with a source of heat.

Paris. Soc. Geol. Bull., XII., 1840-41.. 135-143.

Loop. Preliminary researches on the alleged influence of solar light on the process of combustion.

Amer. Ass. Proc. XI., 1857.. 93-109.

[On the effect of magnetism on chronometers.

Edinb. Phil. Mag. VI., 1822.. 228-239]

Wood On the incombustibility of wood.

Cherbourg. Mem. Acad. Soc. 1843.. 339-348

Catalysis.. On the catalysis of oxygen.

Erdman. Journ. Prak. Chem. LXXXVI., 1862.. 193-215

Lenz, Emil., 14

———, 30, 33, 36

———, 32.

Lenz, and Saweljev

Le Roux, F. P., 4

———, 5

Meter. On the relation of the sulphate of copper solution in the galvanic circuit.
Poggen. An. XLIV., 1838..349-356

Dyna-mos. On the influence of the velocity of revolution on the induction currents produced by magneto-electric machines. (see 33 & 35)
do., LXXVI, 1849..494-523.

Meter. On the conduction of galvanic current through solutions when the section of the same is different from the surface of the electrodes plunged in it.
Petersb. Acad. Sci. Bull. X., 1852..129-142.

" On galvanic polarization &c
An. de Chem. XX., 1847..184-217

Dyn-amos. Memoir on magneto electric machines.
Comptes Rend. XLIII., 1856..802-805

" Studies on electro-magnetic and magneto-electric machines.
do., XLV., 1857..414-417

Le Roux, J. P., 11

Leroy, —

Lester, —

Lestiboudois, Themistocles, 12

——, 22

E.Light On the production of ozone by means of a platinum wire rendered incandescent by means of an electric current.
Comptes Rend. L, 1860.. 691-692.

" New acid obtained by slow combustion of alcohol around an incandescent platinum wire.
Brux. Acad. Sci. IV, 1837.. 283-285, 362-363.

Shade: On the increase and projection of light.
Tilloch Phil. Mag. LII, 1818.. 68-71

Fibre Note on the possibility of distinguishing filaments of linen and cotton by microscopic observation.
Lille, Mém. Soc. Sci. ~~XXXV~~. 1836-38, 219-222.

Fibre Comparative structure of stems of vascular vegetables.
Comptes Rend. XXXIX, 1854.. 880-884, 987-991.

Leube, G.

Leuchtenberg, M. duke of., 5

——, 6, 47. 49.

Levol, A.

Vacuum Preparation of Phosphoric acid.
Erdm. Journ. Prakt. Chem. 11., 1834.. 276-278.

Metal Investigation of the sulphate of copper solution which is used in galvanoplastic work.
do., XXXVIII, 1846.. 312-318

" On the formation and ingredients of the black deposite which forms at the anode by decomposition of sulphate of copper. (see also 7 & 9.)
do., XXXIX., 1846. 290-297.

Moulds Observations on the phenomena which
carbon accompany the precipitation of a metal
-izing &c in the metallic state by another in presence of a third metal which does not exercise any chemical action, and on the circumstances which can modify the results.
An. de Chemie, XLV., 1837.. 285-290.

~~Lewis~~, W. J.

Lindley, John, 15

Lipowitz, A., 4. + 5

Lockey, F.,

Louyet, P., 23.

Löwenthal, J., E. Lenssen

Fibre On the plant yielding the rice paper of China.
India Agri. Soc. Journ. VIII., 1854. 65-66.

Fibre Notes upon vegetable tissue.
Roy. Inst. Journ. II., 1831. 264-269.

Photo-metry How to determine the strength of light in the quickest and best manner for photographic purposes.
See 4 + 5.
Pogg. An. LXI., 1844. 140-144.

Dynam-os. On an electro-magnetic engine.
Sturgeon. Ann. Electr. III., 1838-39. 14-16.

Meter On the polarization of the electrodes of the voltameter.
Brux. Acad. Sci. Bull., XVI., 1849. (pt. 2) 39-41.

On the catalysis of Oxygen.
Erd. Journ. Prakt. Chem. LXXXVI., 1862. 193-215.

Lydiat, E., 2.

Maas, A. J., 3.

——, 13.

Mc Connell, B. R.

Mc Gauley, J. W. 1 (re 2. 3.4.)

Fibro A description of the Smicrologometer for ascertaining the tenacity of silk cotton, metals, linen threads &c.

Nicholson Journ. XXXII., 1812.. 81-85.

Loofo Ignition of fine metallic wires in the bosom of a liquid which is decomposed by galvanic action.

Bruxelles, Acad. Sci. Bull. XIV, 1847. 432-440 (pt. 2) - 19-40.

Meter On electrochemical decomposition by different voltameters.

do., XVI., 1849.. (pt. 2.) 413-423

Dyn-amos. Notice of a revolving electro-magnetic instruments..

" An enquiry into the possibility and advantage of the application of magnetism as a moving power, with remarks on the nature of magnetism.

Brit. Aso. Rep. 1835. (pt. 2) 20-25

Macgowan, D. J.

Maskell, G., 2.

Macleod, John

Magnus, Gustav., 42.

——, 52.

Magrini, Luigi, 3.

Notice regarding the plants yielding the fibre from which the grass cloth of China is made.
Silliman, Journ. X, 1850.. 207-214

Loop. Meter (heating act. of ?) An account of experiments with a constant voltaic battery, in which metals were ignited in an acidulated solution.
Lond. Elect. Soc. Proc. 1841-43.. 6-9.

Dyn-amos. Description of an electro motive engine
Calcutta, Journ. Nat. Hist. VI, 1846.. 177-184

Cata-lysis On the condensation of gases on the sur-face of smooth bodies.
Berlin Bericht.. 1853.. 378-383.

Meter Electrolytic investigations. (see 55.)
do., 1856.. 158-161.

Dyn-amos. New electro-magnetic motor.
An. Lomb. Sci. Veneto, VI, 1836.. 154-161

Maizière, — de.

Majocchi, G. A., 6.

Mallet, G. W., 26

Mallet, Robert

——, 12.

[On a hydraulic machine whose motive force is the air spring when the latter is compressed by impulses of the waves of the sea.
Paris, Soc. Philom. Bull. 1817. 97-100.]

Dyn. amos. On electro magnetism considered as a motive force.
Atti. Scienz. Ital. 1843. 503-505.

Mercury. Note on the extent to which mercury volatilizes along with the vapor of water at 100°.
Silliman Journ. XXX., 1860. 124-125

Fibre On bleaching certain varieties of turf for the purpose of producing a white fibre for the manufacture of paper.
Brit. Ass. Rep. 1835 (pt. 2) 117-119.

Notice of experiments in progress on the action of a heat of 212°F, when long continued, on organic and inorganic substances.
Brit. Ass. Rep. 1838, 313-315

Marbach, Woldemar

Marié-Davy —, 13.

——, 15

——, 26

Marrian, J. P.

Martens, M., 3.

Experiments on some contact substances which assist or oppose the combustion of others.
Erdmann. Journ. Prakt. Chem XIX., 1840.. 144-150.

Dyn-amos. First note on the new electro-magnetic machine.
Montpellier Acad. Sci. Mem. II., 1851-54.. 441-443.

" On the analytical and experimental theory of electro-motors.
Comptes Rend. XL., 1855.. 954. 957. 1139-40.

" On electricity considered from a mechanical point of view.
do., LIV., 1861.. 1104-1107.

[On the sonorous phenomena of electro-magnets.
Phil. Mag. XXIV., 1844.. 382-384]

Vacuum. Loop. On the combustion of phosphorus in vacuo.
Quet. Cor. Math. IV., 1828.. 248-249.

Martens, Martin, 9.

——, 16.

——, 41

Martin, A.

E.Light On the slow combustion of alcoholic vapor around a platinum wire heated to incan--descence.

Bruxelles, Acad. Sci. Bull., III, 1836.. 420-424.

E.Light: On the products of the slow combustion of alcoholic vapor and vapor of ether around an incandescent platinum wire.

do., IV., 1837.. 59-61. also

" VI 1839.. 95-103.

Report on the "Notice relative to the difference electrochemical decompositions of the different electro voltameters." by M. Maas

do., XVI., 1849. (pt. 2) 347-352.

Globes Shades. On a process of cold silvering of glass, by the employment of inverted sugar.

Comptes Rend. LVI., 1863.. 1044-1045.

Martius, C. F. P. 64

——, 56

Masson, A. 11, 12, 13, 21, 22.

——, 15

——, & L. Courtépée

Fibro Experimental commentary on the plants described in Marcgrav & Piso's work on Brazil, with further remarks on the flora of this kingdom.
Hooker Lond. Journ. Bot. V., 1853. 161-169, 200-207, 271-276.

" On the length of the growth of the shoots
Bamboo. of bamboo cane.
München Gelehrte Anz. XXIII., 1846. 979-991.

Studies on electro photometry. 1st & 2nd Memoirs. (also 12. 13 & 21, 22
An. de Chim. XIV., 1845. 129-195.

A Light. Note on the electric light.
Comptes Rend. XL., 1855. 914-916.

Loop. On the radiating power of bodies.
Comptes Rend. XXV., 1847. 936-938

Electric power of the sun's rays.
Quart. Journ. Sci., II, 1829. ~~310-313~~ 430-431.

Mastiro, J. W., 3.

Malcucci, Carlo, 41.

——, 55.

——, 151, 157, 164

Matthiessen, A., 25

Fibro Calcutta Flora &c. containing a synopsis of plants indigenous to, or cultivated in the neighborhood of Calcutta, arranged according to their natural families; with observations on the properties and manner of cultivation of some of the most interesting.

India Agri. Soc. Trans. VII., 1840..39-85.

Meter On the propagation of electric currents in liquids.

An. de Chem. LXVI., 1837.. 225-313

" On the chemical force of the current and and its relation with the course of combination of bodies decomposed.

An. de Chem. LXXI., 1839.. 90..112.

A Light New observations on the voltaic arc.

Comptes Rend. XXIX., 1849..263-267

Mercury On the influence of traces of foreign metals on the elect. conduct. power of Mercury.

Phil. Mag. XXIII., 1862..171-179.

Matthiesen, A., & M. Holzmann,

Medinger, H., 5

——, 8

Meinecke, J. L. G., 25

Melloni, M.

Meter On the effect of the presence of metals and metalloids upon the electric conducting power of pure copper.
Phil. Trans. 1860..85-92.

Dyn. amos. On the theory of electro magnetic power machines.
Heidelberg. Verhandl. Nat. Med. Ver. 1857-59.. 247-250

Meter On the galvanoplastic metallic deposits.
do, 1862-63.. 116..117.

E Light On illumination with the electric light.
Gilbert An. LXII., 1819..87-92

Shades Globes. On the pretended influence that the asperities and polish of surfaces exercise on the emissive power of bodies.
Paris Comptes Rend. VII., XXXVIII., 298-303.

Melloni, M. 44.

Melly, E., 2.

Mercer, John.

Merryweather, George

———, 2

Messier, Charles, 4

[On the identity of certain different luminous, calorific and chemical radiations.
Comptes Rend. XXV., 1842.. 454-460.]

Clamp. Note on some experiments undertaken with the object of covering other metals with platinum.
Bibl. Univers. XVI., 1838.. 375-382.

Catalysis. On some peculiar instances of (so-called) catalysis.
Brit. Ass. Rep. 1842. (pt. 2.) 32-33.

E. Light. Account of a platina lamp.
Edinb. New. Phil. Journ X., 1831. 359. 361.

Account of an apparatus for maintaining a uniform temperature.
do., XIV., 1833.. 360-364.

Mercury Vacuum. Observations on the sublimation of mercury in the vacuous part of barometer tubes produced by the suns rays.
Paris, Mem. de L'Institut, II., 1798-99.. 473-483

Meyer, Lothar, 8

Midre, & A. Charière

Miller, H. B., 2.

———, 3

Mercury. Convenient arrangement for cleaning mercury.
Fresenius, Zeitschr. Anal. Chemie II., 1863.. 241–242.

Vacuum. Apparatus for indefinitely preserving a vacuum under the receivers of pneumatic machines.
Lyon: Soc. Agric. An. IV., 1860.. 151-183

Catalysis. On the oxidation of Palladium during its effecting the union of the hydrogen and oxygen gases from ether, alcohol &c.
Thomp. An. Phil. XII., 1826.. 20–21

" Addition to the list of substances that cause a coil of platinum wire to continue in a state of incandescence (having been heated previously to redness) when held over vapour arising from their evaporation.
Thomp. An. Phil. XII., 1826.. 21-23.

Miller, W. A., & J. F. Daniell

Mitscherlich, C. G., 4.

Mitscherlich, Eilhardt, 53

——, 66.

Mohl, Hugo von, 21

——, 60

Meter Additional researches on the electrolysis of secondary compounds.
Phil. Trans. 1844.. 1-19.

Globes On the human saliva. (see 5. also)
Pog. An. XXVII., 1833.. 320-344.

Catalysis Chemical decomposition and composition by contact.
Berlin, Bericht., ~~III~~, 1841.. 379-396.

Fibro On the composition of the walls of plant cells.
do., 1850.. 102-160.

" On the structure of the vegetable cell membranes. (see on structure of ring vessels. 22)
Flora, XXII., 1839.. 81-96, 97-107, 113-126, 129-...

" Some indications of the structure of bast.
Bast Botan Zeitung. XIII., 1855, col. 873. 881, 889-897.

Mohr, Carl Friedrich, 13.

Magno, F., 22.

Moll, G., 7.

——, 38.

Moore, David, 4.

Morren, Charles., 3.

——, 4.

Glass. Boring of glass.
Liebig An. XVIII., 1836.. 343-344

Aerostatics. Aerial navigation with or without baloons.
Les Mondes, II., 1863. 117-124, 152-160, 180-183.

Dyn-amos. Account of electro magnetic experiments
Edinb. Phil. Journ. VI., 1822.. 83-85, 220-224

Vacuum. Historical notice respecting the inflammation of phosphorus in vacuo.
Edinb. Journ. sci. V., 1831., 141-143

Wood. On the formation of wood in plants.
Irish Acad. Proc. V., 1853.. 187-195.

Vacuum. On some gaseous combinations operated under electric influence.
Comptes Rend. XLVIII., 1859.. 342.

On the phosphorescence of rarified gases.

Morren, Charles., 7.

Muller, Dr. J.: 22

——, 38

Münnich, J. J.

Murray, John, 53.

Napier, James., 3.

Geiss. On the electric conductivity of rarified
Light gases.
Comptes Rendues, LIV., 1862.. 735-737

Dyn. On the theory of the electro-magnetic ma-
-amos. chines.
Pog. An. LXXXVII., 1852.. 597-600; LXXXVII, 1852.. 312-314.

" Investigations on electromagnetism.
do., CV., 1858.. 547-550.

Pump. Amalgamated iron and its relation in the galvanic battery.
do., LXVII., 1846.. 361-364.

E.Light Detail of experiments on the ignition of wires by the galvanic battery.
Edinb. Phil. Journ. VIII, 1828.. 88-91.

Meter Observations on the decompositions of metallic salts by an electric current.

Napier, James., 6.

Nees van Esenbeck, C. G., 34.

Negro; S. dal. 5, zu 6. 7

—, 11.

—, 16.

Nesbit, J. C.

Meter On the unequal decomposition of electro-lytes, and the theory of electrolysis [1846]
Chem. Soc. Mem. III., 1845-48.. 47-53.

Fibre Brazilian bamboos and others coming
Bamboo originally from the East Indies.
Linnaea, IX., 1834.. 461-491.

Dyn. Notices of electro magnetic experiments.
amov. Ann. Soc. Lomb. Veneto 1, 1831.. 278-280

" New electro magnetic machine.
do., IV. 1834.. 67-80.

" Dynamo-magnetometers. [1837]
Modena Soc. Ital. Mem XXI., 1837
323.. 334.

D " On electro magnetic coil machines.
Sturgeon Ann. Elect. III., 1838.. 203-206

Neumann, F. E., 16.

Nicklès, James, 14.

——, 17.

Nicod-Delom, J. S.

Niépce de Saint Victor, Abel, 23

Photo-metry - Photometric processes to determine the intensity of the ordinary and extraordinary ray as also the reflected light &c.
Pogg. An. XLIII 1837.. 497-514.

Dyn-amos - Application of electromagnetism in locomotion and in the transmission of motion
Comptes Rend. XXXII, 1851.. 682-683

" New system of electro magnets.
An de Chemie XXXVII., 1853.. 399-405.

Photo-metry. Description of a new Photometer
Bibl. Univer. I., 1816.. 255-261.

Observations on the Photometer
do., LV., 1834.. 55-63.

[Note on the activity communicated to a body by light striking upon it.
Comptes Rend. XLVIII., 1859-741-742.]

Nobili, L., 10

Nobili, Leopoldo, 33

——, and V. Antinori,

——, 2.

Oeri, —

Ohm, G. S., 7.

Mercury On the appearances and the movements in an electrochemical sense, experienced by mercury.
Bibl. Univers. XXXV., 1827.. 261-284.

Dyn-amos. On the action of hollow magnets.
Pog. An. XXXIV., 1835.. 270-271

" On the electromotive force of magnetism
An. de Chemie XLVIII., 1831.. 412-430.

" New electromagnetic experiments ~~and~~ on the physical theory of magnetism of rotation.
Ann. Sci. Lomb.: Veneto II., 1832.. 166-169

Meter On spiral spring balances.
Schweizer Gesell. Verh. 1841.. 212-231

E. Light Theoretical deduction of the law according to which the incandescence of wires is governed in the battery, and a careful treatment of the modification which the electric current undergoes through the

Ohm, G. S., 7

——, 21

O'Neill, Charles, ph.

——, 3.

——, 4

——, 5

influence of points.
Kastner's Archiv Naturl. XVI., 1829.. 1-53.

Meter ×× 4., On the change of conductivity of watery solutions by heat (Important)
Pog. An. LXIII., 1844.. 389-405

Fibre Upon the appearances of cotton fibre during solution and disintegration
Manchester Phil. Soc. Proc. III., 1862-63, 123.124.

" On an apparatus for measuring tensile strengths, especially of fibres.
do., III., 1862-63.. 186-188.

" Experiments and observations upon cotton.
do., III., 1862.63., 188-190.

" The structure of the cotton fibre.
do., III., 1862.63.. 197-198.

Örsted, H. C. 46 (see 45, + 48.)

——, 104

Osann, G., 40.

——, 46 (see 42, 44, 45, 48, 49, 50, 51, 52, 64.)

——, 89

Osiander, F. B. 6.

Dyn- Electromagnetic experiments.
-amos. An. de Chemie. XXII., 1823..201-203.

Mercu- On the changes which Mercury some-
-ry. -times suffers in glass vessels hermeti-
-cally sealed.
Brit. Ass. Rep. 1846..

Gum guiacum as a reagent for the elec-
-tric current.
Pog. An. LXVII., 1846..372-374

On the nature of Ozone.
Erd. Journ. Prakt. Chem. L., 1850..209-220.

Meter On some facts of electrolysis. (See 93, 98.)
Pog. An. CIII., 1858...616-620

Experiment on the conservation of animal
and vegetable bodies in wood charcoal.
Froriep., Notizen, 1., 1822..col. 166-167..

Pacinotti, Luigi.

Page, Charles G., 5 (see passim.)

Parkes, E. A., 2.

Parnell, E. A., 3.

Parolletti, Modeste., 2

Parrot, F., 6

Dyn- On an electromagnetic pile.
-amos. Amici Giorn. Toscano. 1., 1840. 506-512

" Experiments in electro magnetism (On the disturbance of molecular forces by magnetism)
Silliman Journ. XXXIII., 1838. 118-120

Micro- On microscopical reagents.
-scope. Micros. Journ. 1., 1853., 139-141

Vacuum On some instances of restrained chemical action.
Brit. Ass. Rep. ~~XI.~~, 1841., (pt. 2) 51

[On the influence that light exercises on the propagation of sound.
Turin, Mem. Acad. 1805-8. 141-159.]

Dyn- Of hollow electro-magnets and the action
amos. of inner spirals on the same.
St. Petersb. Acad. Sci. Bull., 1, 1836. 121-125

Pasteur, Louis, 51.

Patterson, Robt., 11.

Payen, Anselm., 52.

Pellis, Ph., J. Henry.

Pelouze, J., 61.

Peltier, Athanase

Vacuum Examination of the role attributed to the oxygen of air in the destruction of the animal and vegetable matter after death.

Dyna-mo-motor [Description and rationale of the operation of a simple apparatus, which may serve as a substitute for the Ship Pump, and which will require no manual labor whatever. [1817]
Amer. Phil. Soc. Trans. 1., 1818., 427-429]

Wood On the means of isolating the elementary tissue of wood. (see 54, 60; 65.
Comptes Rend. VII., 1838.: 54-55

Dyn-amos. Memoir on a new electro motor.
Comptes Rend., XLV., 1857.. 367-369

Wood &c. Note on cellulose.
Comptes Rend. XLVIII., 1859.. 327-328.

E Light Peltier New experiments on the caloricity of electric currents.
An. de Chemie LVI., 1834.. 371-386.

Peltier, A., 3

Perret, Adolphe, 8.

Person, C. C., 4.

Peterin, Jul., + E. Weiss

Petrie, Wm. 5.

Dyn. Electromagnetic experiments.
amos. An. de Chemie, LX., 1835..261-271

Meter Note on the influence of the electrodes in sulphate of copper voltameters.
Comptes Rend. XLIX., 1859..37.39.

Loop: Memoir on the slowness of evaporation in incandescent vessels..(sic.?),
Comptes Rend., XV, 1842..492-494.

" Investigation on the tones of flames from liquid and solid bodies.
Wien, Sitzber. XXXII., 1858..68-75

On the application of electricity and heat as moving powers.
Edinb. New Phil. Journ. L, 1851. 66-70

Dyn. ~~On the~~ applicab Magneto electric
-amos machines, double acting; with experiments thereon.
Baumgartner Zeitschrift, VII., 1840..65-78.

Petrina, F. A., 12.

——, 13.

Peyrard, F.,

Peyron, ——

Pfaff, C. H., 41.

Dyn- Contributions to the construction of mag-
-amos -neto electric machines.
Pog. An. LXIV., 1845. 58-64.

Meter On the nature of the resistance in a
voltameter introduced into the galvanic cur-
-rent.
Pog. An. LXIV., 1845. 356-366.

Loop Description of a burning mirror, by
Clamp. means of which we may reflect and
fix on any object, whether at rest or in
motion, the solar rays in as great a
quantity as we please.
Tilloch, Phil. Mag. XXVII., 1811. 133-146,
176-185.

Rubber Note on the property possessed by caout-
-chouc of allowing gas to escape.
Comptes Rend. XIII., 1841., 820-824,

Mercu. Transfusion of gases and quicksilver
-ry vapors through Wedgewood retorts.
Schweigger Journ. XVIII., 1816. 80-82

Pfaff, C. H., 88

——, 98.

——, 111

——, 115

Loop. On the capacity possessed by metal wires which have served as conductors in "volta-meters", to give off gas even after contact has been broken.

Schweigger, Journ. LIII., = (Jahrb. XXIII.,) 1828.. 77-85.

Dyn-amos. Extraordinary increase of the magnetising influence of an electric current on soft iron, by a simple arrangement.

Schweigger, Journ. LVIII., (= Jahrb. XXVIII.) 1830.. 273-277.

Globe, Vacuum. Loop. Notice on the compound of Nitrogen with the metals especially with copper in an incandescent state.

Pog. An. XLII., 1837.. 163-166.

Dynamos Notice of hollow magnets compared with solid ones.

do., L., 1840.. 636-637

Pfaff, C. H., 120.

Phillips, R.

Pinaud, A., 4.

Place, Francis.

Plateau, J. A. F., 16.

Exp. amos. Experiments on the influence of the mass of iron in electromagnets on the strength of magnetism with equal strength of the electric current.

Pog. An. LIII., 1841.. 313–315

E Light The application of the incandescent power of voltaic electricity to the lighting of mines.

Archives de l'Electricité V., 1845. 547-550

Photo-metry. Memoir on the coloring by electricity of paper impressionable to light, and on a new class of electrical imprints.

Comptes Rend. XVII., 1843.. 761-764

Meter On the cause of the copper deposits on the clay cells of Daniell's battery and on its prevention.

Pog. An. C. 1857. 590-595

Photo-metry. On a principle of photometry

Bruxelles, Acad. Sci. Bull. II., 1835. 52-59

Plateau, J. A. F., 29

Playfair, Lyon., 12.

Pleischl, Adolf. 11.

———, 12

———, 16.

Plücker, J., 48

Mercury Pump. Vacuum. On the means of producing a vacuum by the aid of the centrifugal force of mercury.
Bruxelles, Acad. Sci. Bull. IX., 1842 (pt. 2), 178-180.

Catalysis. On transformations produced by catalysis.
Phil. Mag. XXXI., 1847.. 192-214.

Loop. Of the decandescence of Palladium in a stream of Hydrogen.
Schweigger, Journ. XXXIX. (= Jahrb. IX.), 1823.. 351-356

[Experiments on cutting steel with soft iron
Kastner Archiv Naturl. 1, 1824.. 449-457]

[On Selenium crystallized by the dry way.
do., IV, 1825. 341-342.]

Dyn-amos. On the reciprocity of the electro-magnetic and magneto electric appearances
Pog. An. LXXXVII., 1852.. 352-386

Poey, A., & M. Vergues.

Poggendorff, J.C., 75.

——, 99

——, 101

——, 125

Mercu-ry. On the application of electro chemistry to the extraction of metals introduced into and remaining in the system.

Bibl. Univers. Archives XXVIII., 1855. 208

Photo-meter. Further methods for the measurement of the strength of light:—1. A. von Humboldt's Astrometer. 2. Potter's Photometre 3. Lamprotometer.

Pog. An. XXIX, 1833., 484-493.

Dyn-amos. On the method of raising the electromotive force of the galvanic current to an unlimited degree.

Berlin Bericht, 1843, 291-299.

Meter. On the method of liquids to the electric current.

do., 1844., 299-313

Dynamos. On the permanent 'drag' of closed electro magnets.

do.; 1851., 670-674

Poggendorff, J. C., 131

Pohl, J. J., 25.

Ponton, M., 4.

Pooley, Charles.

Porter, C. H., & B. Silliman

Pösche, Theodore.

[On a new method of making tones by the electric current
Pog. An. XCVIII., 1856. 193-203]

Photo-metry Some photometric determinations.
Dingler, Polytechn. Journ. CLX, 1861. 450.

" On solar light and a simple photometer.
Edinb. Roy. Soc. Trans. XXI., 1857. 363-368

Globes On engraving collodine photographs by means of fluoric acid gas.
Brit. Ass. Rep. 1856. (pt 2) 58

Photo-meter Notice of a photometer and of some experiments therewith upon the comparative power of several artificial means of illumination.
Silliman, Journ. XXIII., 1857. 315-318

Aero. A plan for aerial navigation by means of static steamers without the aid of a balloon.
Frank. Inst. Journ. XXV., 1853. 176-178

Potter, Richard, 8.

——, 30.

Pouillet, C.S.M., 15

Poumarède, J.A. & L. Figuier

Powell, Baden, 8

Photo-metry. On an instrument for photometry by comparison, and on some applicability of it to optical phenomena.
Phil. Mag. I., 1832..174-181.

On photometry in connection with physical optics
do., XVI., 1840., 16-23.

Meter ++ On the quantities of electricity necessary to chemically decompose a gramme of water or to give greater or less commotions in determinate circumstances.
Pog. An. XLII., 1837..297-306

Wood. On lignite and on the products in wood which accompany it.
Comptes Rend XXIII., 1846..918-920

An historical sketch of photometry, with remarks.
Thomp. An. Phil. XI., 1826..371-381.

Powell, Baden, 118

Loop. On converging sunbeams.
Brit. Ass. Rep. 1852. (pt. 2) 12.

Menlo Park Notebook #129 [N-80-09-09]

The dated entries in this notebook cover the period September-October 1880, but the book was probably begun earlier in the year. Most of the entries are by Francis Upton. There are also a few entries by Edison and probably by William J. Hammer. The material by Upton includes calculations about the cost of a central station; calculations about the conductors needed for the first New York central station (another member of the staff, probably Hammer, assisted Upton in gathering the statistics); and calculations concerning the location of the New York central station. The material by Edison includes calculations and drawings relating to tubes for conductors, along with calculations about the conductors needed for the New York central station. The label on the front cover is marked "Upton" and "Estimates Conductors." The book contains 284 numbered pages.

Blank pages not filmed: 174-175, 270-281.

Missing page numbers: 107-108, 223-226.

Boilers

Engines

magnets
7.5
3"

5 20
240
800
6
4800
6.5
24000
28800
31200

140
~~Mea~~ wire on magnet
140 lbs present machine
3
420
3 ~~8~~ cts per lb
126.00
33 6 0
159.6

25
18
200
25
450

Faradic Machines JW

Poles 4000 lbs. @ 4 cts	$160.
Magnet 4800 lbs	312.
Cu. Wire on magnet 420 lbs	169
Zn. castings	150.
magnets	$ 782.

Armature

Plates	$ 450.
Shaft &c page 9	350.
Commutator &c brush holders	200
Copper wire estimated	60
	1842

Labor will ~~bring it to about~~ Cost $200 ~~$2000~~

2042

Plates 1800 @ $25. per hundred
$450

Magnets present machine
Bars 260 lbs.
260
back 280
800 lbs.
2 times as large
1600 lbs.
3 magnets
4800 lbs.

Faradic Machines

Shaft
Sole plate
Bearings
Sleeve

Estimated Mr. K
$ 350

Faradic Machines

Foundation

Iron Stucture

Wood Flooring

Iron floors and supports.

Conductors

80

Estimate taken from the old one with revisions

Boilers & chimney for 1250 H.P at 3 lbs of coal	\$ 21,000
Engines	21,000
Foundation	2.000
Iron Structure	8 500
Wood flooring	1 000
Water heaters and pumps	7.000
Iron floor and supports	6 000
Faradic machine	24000
	85.500
	50.000
	\$ 135.500

5 per H.P.
6 per H.P.
7 per H.P. in current 75% back
8 per H.P.
9 per H.P.
10 per H.P.

From Thomas street to Canal street 1600 feet 2.8 inches on large map of N.Y.

~~40~~ ~~X~~ ~~D~~' = 1600 feet

~~260~~ = ~~1600~~

7 = 40

7 division = 40 feet

2.8

Fire District bounded by
Wall in No. 4
all No. 6
all No. 5
To New church in No. 3

Fire District No 3

Broadway

Wall to Pine	240
Cedar	200
Liberty	175
Maiden Lane	240
	855

Nassau	855
Wall	310
Pine	310
Cedar	320
Liberty	320
Maiden Lane	330

Fire District No. 4.

Wall Street TWE

~~W~~ William to W Nassau	435 feet
W. Pearl to W. William	238
	282
	520 feet
W. Water to W. Pearl	180 feet
W. Front to W. Water	202
W. South to W. Front	270
	1607
	2
	3214
	2
	6428

TWE

Fire District No. 4

T & E

Pine Street

W. William to W. Nassau	430 feet
W. Pearl to W. William	520 feet
W. Water to W. Pearl	180
W. Front to W. Water	202
W. South to W. Front	270
	1602
	2
	3204 feet
	2
	6408

Cedar Street

W. William to W. Nassau	430
W. Pearl to W. William	520
	950
	2
	1900
	2
	3800

T & E

in District No. 4

Liberty St.

W. William to Nassau	430. feet
Maiden Lane to William	200
	630
	2
	1260
	2
	2520

Maiden Lane

W. William St to W. Nassau	455 feet
W. Pearl to W. William 300 250	550
W. Water to W. Pearl	260
W. Front to W. Water	202
W. South to W. Front	270
	1737
	2
	3474
	2
	6948

TWE

District No. 4

TWE

Nassau St.

N. Pine to N. Wall	240
N. Cedar to N. Pine	210
N. Liberty to N. Cedar	210
N. Maiden Lane to N. Liberty	210
	670
	2
	1340 feet
	2
	2680

William Street

N. Pine to N. Wall	240
N. Cedar to N. Pine	210
N. Liberty to N. Cedar	210
N. Maiden Lane to N. Liberty	200
	860
	2
	1720
	2
	3440

TWE

Fire district No. 4

Pearl Street

N. Pine to N. Wall	240 feet
N. Cedar to N. Pine	210
N. ~~Liberty~~ Maiden Lane to N. Cedar	270
	620
	2
	~~1320~~ 1240
	2
	~~1640~~ 2480

Water Street

N. Pine to N. Wall	210
N. Maiden to N. Pine	280
	490
	2
	980
	2
	1960

Fire District No. 4

Front Street.

TWE

n. Pine Street to n. Wall St.	210
n. Maiden Lane to n. Pine	290
	500
	2
	1000
	2
	2000

South Street

n. Pine to n. Wall St	210
n. Maiden Lane to n. Pine	290
	500
	2
	1000
	2
	2000

TWE

Fire district No. 5 TOE

Maiden Lane

W Gold St. to W Pearl	243 feet
W. Pearl to W. Water	274
W Water to W. Front	203
W. Front to W. Water	300
	1020

Fletcher St

W. Pearl W. Water	280
W. Water to Front	210
W. Front to South	291
	681
	2
	1362

TWE

Fire No 5 TWE

Platt Street 3,0

John St and Burling slip

Gold to Pearl	400
Pearl to Water	214
Water to Front	220
Front to South	297
	1131

234
2
468

TWE

Fulton St

W Gold to Cliff	300
W Cliff to Pearl	245
W Pearl to Water	132
W Water to Front	215
W Front to South	306
	1198
	195
	1393
	4
	5572

TWR

Fire No 9

Beekman St

Gold to cliff		478
W Cliff	Pearl	245
	Water	208
	Front	194
	South	223
		1348
		4
		5392

Ferry & Peck slip		
Gold - cliff		451
	Pearl	230
	Water	220
	Front	200
	South	196
		846
		2
		1792

Fire no 5

Frankfort & Dover

Jacob	216
Cliff	190
Pearl	225
Water	363
Front	192
Smith	192
	1378

Tal

Fire no 5

Gold	Ster	
N. Maiden	Platt St	233
	John	153
	Fulton	415 386 4
	Beekman	265 1544 530
	Ferry	333
	Frankfort	270
		1669

Jacob Street 317

THE

Fire No 5

Cliff St

John to Fulton	375
Beekman	2.68
Ferry	330
Frankfort	358
	1331

Pearl St

fr Maiden Lane to Platt	300
John	145
Fulton	348
Beekman	265
Ferry	360
Frankfort	374
	1792

TLK

Fire No 5
Water Street
Maiden Lane to Fletcher

	142
Burling Slip	250
Fulton	340
Beekman	300
Peck Slip	378
Dover	408
	1818
	408
	1410
	4
	5640

T.A.E.

Fire No. 5

Front St

Maiden	Fletcher	133
	Burling Slip	213
	Fulton	257
	Beekman	287
	Peck slip	358
	Dover	384
		1642
		384
		1308
		52[illegible]

South St

Maiden	Fletcher TAG	125
	Burling Slip	200
	Fulton	250
	Beekman	300
	Peck slip	340
	Dover	413
		1028
		433
		1215
		2
		2430

Fire No. 6.

Maiden Lane

W. Gold to W. William	330
W William to W Nassau	445
E Broadway	340

Platt Street	280
	4
	1120

John Street

TAE

W Gold to William	250
Dutch	150
Nassau	230
	690
	4
E Broadway	376 2760

Fire No 6

Fulton

W. Gold William 280

450

Nassau 380

Broadway 1110

380

730

4

2920

Ann Street

Gold to William 300

425

Nassau 350 725

2

Broadway 1450

Beekman St

Gold to Williams 335

Nassau 370

Park row 225

Broadway 930 280

2

1860

Fire No. 6

Spruce St.

W. Gold to W. William St — 370

Nassau — 370

Park row

335

City Hall

Frankfort St. — 380

W. Gold to W. William St — 280

Park row

Tuk

Fire No. 6

Broadway

N Maiden Lane	to N John	215
	Fulton	255
	Ann	140
?. O	Beekman	500

Park Row

Ann to	Beekman	440
	Spruce	300
	Frankfort	225

TAE

Nassau Street

Maiden Lane	to John	210
	Fulton	320
	Ann	150
	Beekman	350
	Spruce	200
		1210
		4
		$\boxed{4840}$
		2420

Fire No. 6
William Street

Maiden Lane to	John	310
	Fulton	370
	Ann	140
	Beekman	235
	Spruce	250
	Frankfort	1305 220

4
5220

T.A.E.

Gold Street

Maiden Lane	to John....	260
		180
	Fulton	390
	Ann	290
	Beekman	
	Spruce	245
	Frankfort	310

From ~~cotee~~ centre to corner of Wall & South

to John 195
on John & Burling Slip 834
Front 346
500
1875 feet

Dover & South
2000 feet

~~||||~~ ||

750 places in map 5

To Herald TAE
195
To Nassau 730
150
300
1375 feet

To Times

1250 feet.

U.S. Treas 1600 feet

In Fire No. 4
Bounderies of district
South – Wall ~~and~~ Nassau –
Maiden Lane
||| 349 buildings

In Fire No. 5
Bounderies
Maiden Lane – Gold St –
Ferry St & Peck Slip – South St.
TAE
|||| 443 Buildings
Fulton market –
Fish market –
Wall St & Sutts St Ferry –
In ~~Fire district~~ Insurance No. 6
Maiden Lane – Nassau
Spruce – Gold

Houses in district bounded by Beekman & Gold Sts and Nassau Sts and Maiden Lane

Taking a space like this as an average size building

14
10

17
16
27
15
20
37
~~[illegible]~~
18
25
21
36
29

271

T.A.E.

349
443
271

1063 Houses

Taking the small houses
~~by~~ as making an average
with the large places and
estimating a few that two
houses equal one — there
are about 1063 Houses
in the districts as mentioned.
each say 100X25

T.W.R.

Counting separate houses and buildings.

In ~~Insurance~~ No 4

Along Wall St = 38
Bet Wall + Pine Sts = 54
" Cedar + Pine Sts = 34
Pearl, Maiden Lane,
South Pine Sts, =

TAE

Counting separate houses and buildings.

Insurance No 4

Wall, Nassau, Pine, William. = 20
20 Houses.
Wall, William, Pine, Pearl. = 23
23 Houses
Wall, Pearl, Pine, Water, = 17
17 Houses
Wall, Water, Pine, Front, = 17
17 Houses.
Wall, Front, Pine, South, = 23
23 Houses T.A.G.
Pine, Nassau, Cedar, William = 20
20 Houses
Pine, William, Cedar, Pearl, = 32
32 Houses
Pine, Pearl Maiden Lane Water = 22
22 Houses

174

Continued on next page

carried forward from page 87 174

Pine, Water, Maiden Lane, Front = 22
22 Houses.

Pine, Front, Maiden Lane South = 22
22 Houses

Cedar, Nassau Liberty - William = 22
22 Houses

Cedar William Liberty, Pearl. = 32
32 Houses

Liberty, Nassau, Maiden Lane
and William - = 26
26 Houses

Liberty William Maiden Lane = 6
6 Houses

304

Total in Ins, No 4

TWR

Insurance No 5

	Houses
Maiden Lane, Gold, Platt, Pearl, =	28
Maiden Lane, Pearl, Burling Slip, and Water, =	41
Maiden Lane, Water Burling Slip Front =	9
Maiden Lane, Front Burling Slip and South =	30
Burling Slip, South, Fulton, Front =	14
Front, Burling Slip Fulton Water =	21
Water, Fulton, Pearl, Burling Slip =	16
John, Pearl, Fulton, Cliff. =	28
Gold, John, Cliff, Fulton =	24
John, Gold, Platt, Pearl, =	25
Fulton, Gold, Cliff, Beekman =	26
Fulton, Cliff, Beekman Pearl =	26
Fulton Pearl Beekman Water =	22
Fulton Water Beekman Front =	20
(Fulton Market) Front, Beekman South and Fulton =	1
Front, Peck Slip, Beekman South =	26
Front Beekman Water, Peck Slip, =	24
Water, Beekman, Pearl, Peck Slip, =	33
	413

continued on next page (91)

Insurance No 5

Carried forward from page 91	=	413
Beckman, Cliff, Pearl, Ferry	=	26
Cliff Beckman, Gold, Ferry,	=	29
	Total in	468

Insurance No 5,

Tal

Insurance No 6

Maiden Lane, Gold, Platt, William = 25
Platt, Gold, William John = 13
Maiden Lane John Nassau. William = 37
John, Nassau, Fulton William $\left.\begin{matrix}25\\15\end{matrix}\right\}$ = 40
John, William, Fulton, Gold, = 24
Fulton, Nassau, William, Ann, = 15
Fulton, William, Ann, Gold = 15
Ann, Nassau, Beekman, William = 37
Ann William. Beekman, Gold = 15
Beekman, Nassau, Spruce, William = 23
Beekman, William, Spruce, Gold, = 25
Total — 269

District 4 – 304
" 5 – 468
" 6 – 269
1041 Total

TKG

Place Station between
Platt – Gold – John – Pearl.
To supply district bounded by —
Wall – Nassau – Spruce, Ferry,
Peck slip — South.

Distance to corners

South and Wall ~~1030~~ 1780 feet
Wall and Nassau 1860 — 1720
Nassau & Spruce 1820
Burling Slip & South 1820

TAE

Place Station between
Platt — Gold — John — Pearl.
To supply district bounded by
Wall — Nassau — Spruce, Ferry,
Peck slip — South.

Distance to corners

South and Wall ~~1030~~ 1780 feet
Wall and Nassau 1860 — 1720
Nassau & Spruce 1820
Burling Slip & South 1820

TAE

Distance from Station to cor of South and Wall Sts ——————————

Distance from station to cor of South and South Burling Slip 80
950
1030 —————— 1030

Distance from ~~Station to~~ South cor of Burling Slip to north cor South and Wall – { 330 / 420 / 750 } { 1030 / 750 / 1780 Total } —— 750

From South Cor Burling Slip, and ~~Beekman~~ slip, to South cor of Peck Slip – 875 —————— 875

From Station to Cor, of Spruce and Gold Sts, —

TWR

From Station to cor. of Spruce and Gold Sts, 50
170 ft
940
1160 ------- 1160

From cor Spruce and Gold to cor. Spruce and Nassau ---- 660
1820

TWR

From Station to cor Wall and Pearl Sts, — ft

150
310
480

940. Total — 940

Cor Wall and Pearl to corner of Nassau

~~120~~ 920 ~~1040~~

~~940~~ ~~120~~ 1060 ~~920~~ ~~1980~~

920
940
1860. Total 920

Total 1860 ft.

TAE

From Station to Maiden Lane
through Buildings. 380 ft — 380
From cor Maiden Lane to cor
of William and Liberty Sts. 380
To cor of Wall and William 540
~~From cor of Liberty and W~~
From Wall and Liberty 420 to Wall 420
and Nassau 420

- 380
- 380
- 540
- 420

1720

Total 1720 ft.

TWR

No Lamp	Distance of T.T.	sq in Cross section wire	lbs of copper wire.
3	1780	.00864	118.8
2	1760	.00570	77.4
3	1740	.00846	112.4
15	1720	.04819	553.5
3	1640	.00795	101.1
2	1600	.00518	64.
3	1580	.00768	93.6
3	1560	.00516	91.2
3	1540	.00747	88.8
3	1520	.00738	86.4
3	1500	.00729	84.3
2	1760	.00570	77.4
3	1740	.0087	120.
3	1720	.00861	117.3
4	1700	.0108	144.4
5	1690	.01375	178.5
6	1680	.01682	211.8
10	1600	.0259	320.
3	1580	.00768	93.6
10	1560	.0253	304.0
25	1520	.0625	720.
5	1510	.01220	140.4
3	1500	.00729	84.3
122		.32305	3985.1

Small	87358	Total
Medium	5360	96420
Large	3702	

TWG

Small cable

Wire No. 0".134

$\bar{1}.1271$
$\bar{1}.1271$
0.4969
$\bar{2}.7511$

sq. in. 0.0564
6 wires
.3384

1740 feet of No. 10 make in Cu

94.6 lbs.

~~98~~
1.9759
1740 3.2405
$\bar{2}.7354$

.054 lb
6 to foot
.324
600
254.400 lbs
2
508.8 lbs Cu in lines

300
230
70
600

Square No. 1.

220 Lamps

230
180
130
390
185
1115
195
1310 feet main line
2620

Main .0021.2
220
4240
424
.46640 sq. in.

Main 21.5
220
4300
430
4730.0 lbs Cu

Small lines 230
70
300
2
600

No. 2

.054 lbs. Cu. to 1 foot
Say 1/2 lb. of ~~main~~ 0.134 diameter
i.e. No. 10 wire

6 wires make good cable
Small cable

386
286
143
137
1052 feet
40 for side walks
1092 feet
2
2184
.054
~~[illegible]~~
2184
726 lbs.

6 wires 1/3 lb
per foot

Square No. 2

Not exact
but close

1115
40
one Main 1075 feet
2
2150
1075
− 135
930 feet from corner where it joins other main lines
330 Lamps
+ 380
1310
1075
2385
2500 feet main
Average 1192

TAE

ED

.00192
330
5760
576
.63360 sq in
.65 sq. in

17.7
330
5310
531
5841.0 lbs
600 lbs

Small line
385
~~387~~
~~143~~
137
522 \| 2 = 1044

Small cable

180
394
390
137
1101 feet

~~367 lbs Cu~~

1141
2
2282
760 lbs. Cu.

390
137
385
385
180
180
1637 feet small pipe

Square No. 3.

300 lamps

40
180
130
390
185
925 feet main to corner

137
390
527 in small on the line

137
396
533
266 feet average to be added
925
1191

.00192
~~300~~
.57600 sq. in.

17.7
300
531.00 lbs. Cu.

1	80	8	220	11	370
	140	2	330		360
2	330		300		320
	320	4	310	14	50
	340	5	400		330
	460	6	150		70
	310	7	180	17	380
	330		230	18	80
	720		[illegible]	19	210
	410		230	20	220
11	610				
	3170		1900		2390

21	260
22	150
23	260
24	300
25	400
26	250
27	210
28	240
	2180

44	180
45	90
46	120
47	80
48	250
49	200
50	150
51	[illegible]
52	
	[illegible]190

~~Square No. 4~~

TW

29	155	36	180
30	260	37	90
31	200	38	200
32	160	39	70
33	200	40	120
34	140	41	140
35	240	42	120
		43	180
	1355		1100

2900
2390
2180
4190
1355
1100

11,115 lamps

Square No. 4

Square No 1.
— " —

270 lights

390
386
195
188
1159 Total ft in block
40 ft in sidewalk
1199 Total.

145
195
39.3
137
34.8.
137.
36.1
80.
61.1
198.
40.
242.
24.2
157.5
1527.0 ft from + on no 1 to + on no 22.

TWR

145
39.3
137.
34.8
137.
36.1
80.
61.1
198.
40.
242.
24.2
157.5
1332.0 ft from – on no 1 to – on no 22

Square No
3-4

Square 2. 333 lights

143
385
137
387
1052
40 sidewalks
1092 Total

192.5
137.
34.8
137.
36.1
80.
61.10
198.
40.
242.
24.2
157.5
1340.2 from + of no 2 to + of 22

193.5
34.8
137.
36.1
80.
61.1
198.
40.
242
24.2
157.5
1204.2 ft from - of 2 to - of 22

Square 3. 300 lights

180
137
390
394
1101
40 sidewalks.
1141 Total

197
137
36.1
80.
61.10
198.
40.
242.
24.2
157.5
1173.9 ft from + of no 3 to + of no 22

197.
36.1
80.
61.1
198.
40.
242.
24.2
157.5
1035.9 ft from - of no 3 to - of 22

Square 4. 340 lights

170
80
395
405
1050
40 sidewalk
1090 Total

197.5
80.
61.1
198.
40.
242.
24.2
157.5
1000.3 ft from + of no 4 to + of no 22

202.5
61.1
198.
40.
242.
24.2
157.5
925.3 ft from - of no 4 to - of 22

Square 5. 440 lights

178
400
384
264
1226
40 sidewalk
1266 Total

200.
198.
40.
242.
24.2
157.5
861.7 ft from + of no 5 to no 22.

192.
40.
125.
242.
34.2
157.5
786.7 ft from - of no 5 to - no 22

7641

Square 6. 250 lights

297
190
193
267
947
40 sidewalks
987 Total

133.5
193.
44.4
192
40.
235.
22.6
185.
1045.5 ft from + of no 6 to + of no 22.

148.5
44.4
192.
40.
235.
22.6
185. ft from - of no 6 to - of no 22
867.5

Square 7. 160 lights

64
328
300
162
854
40 sidewalk
894 Total

150
44.4
64.
40.
235.
22.6
185.
741.0 ft + of no 7 to + of 22

164
44.4
40.
235.
22.6
185.
691.0 ft from - of no 7 to - of 22.

Square 8   220 lights

119
378
110
380
987
40 sidewalks
1027 Total

190
54.3
328.
44.1
40
235.
22.6
185.
1499.0 from + of no 8
to + of no 22

189.
11.0.
54.3
328.
40.
44.1
235.
22.6
185.
1207.0 from - of no 8
to - of no 22

Square 9.   460 lights

296
376
341
185
1198
40 sidewalks
1238 Total

188.
40.2
110.
54.3
328.
40.
44.1
235
22.6
185.
1247.2 from + of no 9
to + of no 22

170.5
185.
40.2
110.
54.3
328.
40.
44.1
235.
22.6
185.
1414.7 from - of no 9
to - of no 9

Square 10: 230 Lights

188
193
300
338
1019
40 sidewalks
1059 Total

169
49.9
185.
40.2
110.
54.3
328.
40.
44.1
235.
22.6
185.
1463.1 from + of no 10
to + of no 22

150
193
49.9
185.
40.2
110.
54.3
328.
40.
44.1
235.
22.6
185.
1617.1 from - of no 10
to - of no 22

Square 11. 370 Lights

188
193
487
492
1360
40 sidewalk
1400 Total

243.5
188.
23.11
108.
34.11
115.
52.10
247.
142.5
35.2
1191.4 from + of no 11
to + of no 22

246
23.11
108.
34.11
115.
52.10
247.
142.5
35.2
1092.9 ft- from - of no 11
to - of no 22

Square 12. 360 Lights

140
108
494
500
1242
40 sidewalk
1282 Total.

250
34.11
115
52.10
247.
142.5
35.2
877.8 ft from - of no 12 to - of no 22

247.
108.
34.11
115
52.10
247.
142.5
35.2
980.91 ft from no + 12 to + of 22

Square 13. 320 Lights

130
500
498
115
1243
40 sidewalk
1283 Total

270
17.
25.
156
157.5
425.5 ft from - of no 13 to - of no 22

250
115.11
52.1
247.
142.5
35.2
841.81 ft from + of no 13 to + of no 22

Square 14. 50 lights

70
162
180
412
40 sidewalk
452 Total.

81
52.6
134.
17.
25.
156. 2/3 [illegible]
157.5
623.1 ft from + of no 14
to + of no 22

90
52.6
134.
17.
25.
156.
157.5
632.1 ft from − of no 14
to − of no 22

Square 15. 320 lights

134
268
243
17
222
884
40 sidewalk
924 Total

134.
17.
25.
156.
157.5
489.5 ft from + of no 15
to + of no 22

60.75
26.5
142.5
229.75 ft from − of no 15
to − of no 22

Square 16.

110 lights

121
122
242
235
720
40 sidewalk
760 Total.

60.5
235.
22.6
185.
503.1 ft from + of no 16 to + of no 22

61
22.6
185.
268.6 ft from - of no 16 to - of no 22

Square 17

280 lights

335
363
241
268
1207
40 sidewalks.
1247 Total

167.5
44.1
235.
22.6
185.
654.2 ft from + of no 17 to + of no 22

181.5
44.1
22.6
185.
433.2 ft from - of no 17 to - of no 22

Square 18. 80 lights

112
120
258
258
748
40 sidewalk
788 Total

129.
54.6
363.
44.1
22.6
185.
798.3 ft from + of no 18
to + of no 22

129
120
54.6
363.
44.1
22.6
185.
918.3 ft from - of no 18
to - of no 22

Square 19. 210 lights

180
95
262
290
827
40 sidewalk
867 Total

131.
40.2
120.
54.6
363.
44.1
22.6
185.
960.5 ft from + of no 19
to + of no 22

145.
95.
40.2
120.
54.6
363.
44.10
22.6
185.
1069.50 ft from - of no 19
to - of no 22

Square 20. 220 Lights

192
191
298
320
1001
40 sidewalk
1041 Total

149.
49.5
95.
40.2
120.
54.6
363.
44.1
22.6
185.
1123.0 ft. from + of no 20 to + of no 22

160
191
49.5
40.2
120.
54.6
363.
44.1
22.6
185.
1230.0 ft. from − of no 20 to − of 22

Square 21, 260 Lights

234
224
285
247
990
40 sidewalk
1030 Total

117
142.5
35.2
294.7 from + of no 21 to + of no 22

123.5
142.5
35.2
301.2 from − of no 21 to − of no 22

Square 22. 140 lights.

117
109
315
370
911 only needed.-
40 sidewalk
951 Total

central station block
measure of block in ft

Square 23. 260 lights

370
335
155
275
1135
41 sidewalk
1175 Total.

77.5
44.9
44.8
177.2 ft from + of no 23 to + of no 22.

137.5
335.
44.9
44.8
562.2 ft from - of no 23 to - of no 22

TAE

Square 24. 30 lights

286
370
215
218.
1089
40 sidewalks
1129 Total.

143
48.4
335.
44.9
44.8
616.1 ft from + of no 24 to + of no 22

185.
218.
48.4
335.
44.9
44.8
876.1 ft from - of no 24 to - of 22

Square 25. 450 lights

282
285
378
428
1373
40 sidewalks
1413 Total

189.
50.8
218.
48.4
335.
44.9
44.8
930.9 ft from + of no 25 to + of no 22

214
285
50.8
218.
48.4
335.
44.9
44.8
1240.9 ft from - of no 25 to - of no 22

Square 26. 290 lights

193
204
320
297
1014
40 sidewalk.
1054 Total.

148.5
193.
44.8
386.3 ft from -'g no 26
to -' no 22

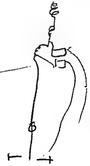
160
44.8
204.8 ft from +'g no 26
to +'g no 22

Square 27. 210 lights

222
218
202
198
840
40 sidewalk
880 Total

111
48.7
320.
44.8
524.5 ft from +'g no 27
to +'g no 22

109
48.4
297.
193.
44.8
692.2 ft from -'g no 27
to -'g no 22



Square 28. 260 lights

285
331
195
188
999
40 sidewalk
1039 Total.

142.5
53.6
222.
48.7
320.
44.8
831.6 ft from + of no 5 to + of no 22

165.5
53.
218.
48.4
297.
193.
44.8
1019.7 ft from - of no 28 to - of no 22

Square 29. 155 lights

138
168
179
187
672
40 sidewalk.
712 Total

69.
179.
25.9
244.
67.
88.
37.4
160..
142.5
35.2
1048.0 ft from + of 29 to + of 22

84.
25.9
244.
67.
88.
37.4
160.
142.5
35.2
884.0 ft from - of no 29 to - of no 22

TdE

Square 30. 320 lights

244
225
174
213
856
40 sidewalks
896 Total.

87.
244.
67
88
37.4
160.
142.5
35.2
861.1 ft from + of no 30 to + of no 22

106.5
67.
88.
37.4
160.
142.5
35.2
636.6 ft from - of no 30 to - of no 22

Square 31. 160 lights

232
246
88
84
650
40 sidewalk
690 Total.

116.
88.
37.4
160.
142.5
35.2
579.1 ft from + of no 31 to + of 22

123
37.4
160.
142.5
35.2
498.1 ft from - of 31 to - of no 22

Square 32. 160 lights

249
227
176
240
883
40 sidewalk.
923 Total

120
124.5
50.1
142.5
35.2
472.3 ft from + of no 32 to + of no 22

88.
124.5
50.1
142.5
35.2
440.3 ft from – of no 32 to – of 22

Square 33. 150 lights

155
97
287
270
809
40 sidewalk.
849 Total

77.5
49.1
45.17
185.
356.77 ft from + of 33 to + of no 22

48.5
287.
49.1
45.1
185.
614.7 ft from – of 33 to – of 22

Square 34. 150 Lights

193.
167.
211.
219.
790
40 sidewalk.
830 Total

96.5
47.6
287.
49.1
45.17
185.
710.37 ft front of no 34 to front of no 22

83.5
219.
47.6
287.
49.1
45.17
185
916.37 ft from front of no 34 to front 22

Square 35. 240 Lights

310
330
167
186
993
40 sidewalk.
1033 Total.

83.5
49.5
219.
47.6
287.
49.1
45.17
185.
965.87 front of no 35 to front of no 22

93.
310.
49.5
219.
47.6
287.
49.1
45.17
185
1285.37 ft from front of no 35 to front of 22

T. A. G.

Square #36.

180 Lights

188
192
158
156
694
40 sidewalk
734 Total

79
188.
24.1
59.
23.8
135.
63.11
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
1312.71 ft from + of 36 to + of no 22

78
24.1
59.
23.8
135.
63.11
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
1123.71 ft from - of no 36 to - of no 22

Square #37.

90 lights

59
50
157
155
421
40 sidewalk
461 Total

78.5
59.
23.8
135.
63.11
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
1100.11 ft from + of 37 to + of 22

77.5
23.8
135.
63.11
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
1040.11 ft from - of no 37 to - of no 22.

TAE

Square 38. 160 Lights

135
134
153
155
577
40 sidewalk
617 Total

76.5
135.
63.11
80
23.4
45.
240.
124.5
50.1
142.5
35.2
1015.31 ft from + of no. to + of no 22

77.5
63.11
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
881.31 ft from - of no 38 to - of no 22

Square 39. 90 Lights

157
80
163
79
479
40 sidewalk.
519 Total

78.5
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
819.2 ft from + of 39 to + of no 22.

81.5
23.4
45
240.
124.5
50.1
42.5
35.2
642.2 ft from - of 39 to - of no 22

N.W.E.

Square 40. 90 lights

196
163
177
189
725
40 sidewalk
765 Total.

81.5
45.
240.
124.5
51.1
142.5
35.2
719.8 [illegible]

88.5
44.9
176.
51.4
185.
545.8 ft. from - of no 40 to - of no 22

Square 41
150 lights

215
205
166
158
744
40 sidewalks.
780 Total

83.
49.9
155.
49.1
193.
44.8
574.8 ft. from + of 41 to +. of 22

79.
215.
49.9
155.
49.1
193.
44.8
785.8 ft. from - of no 41 to - of no 22

Geo. E.

Square 42. 120 lights

141
141
194
194
6.70
40 sidewalks.
710 Total

70.5
100.3
79.
215
49.9
155.
49.1
193.
44.8
956.6 ft from + of no 42
to + of no 22

70.5
194.
100.3
215.
49.9
155.
49.1
193.
44.8
1071.6 ft from - of no 42
to - of no 22

Square 43. 180 lights

296
296
145
144
881
40 sidewalks.
921 Total

72.5
60.1
194.
100.3
215.
49.9
155.
49.1
193.
44.8
1133.7 ft from + of no 43 to + of no 22

72.
296.
60.1
194.
100.3
215.
49.9
155.
49.1
193.
44.8
1429.2 ft from - of no 43
to - of no 22

Square 44 220 lights

196
194
214
220
824
40 sidewalks
864 Total

110.
24.1
55.
23.8
123.
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1342.3 ft from – of no 44 to – of no 22

107.
194.
24.1
55.
23.8
123.
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1533.3 ft from + of no 44 to + of no 22

Square 45. 90 [illegible]

55
52
222
223
552
40 sidewalks
592 Total

111.5
23.8
123.
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1264.7 ft from – of no 45 to – of no 22

111.
55
23.8
123.
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1519.2 ft from + of no 45 to + of no 22.

Square 46. 120 lights

223.
227
114
123
687
40 sidewalk
727 Total.

111.5
123.
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1240.9 ft from + q no 46
to + q no 22

113.5
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1119.9 ft from − q no 46
to − q no 22

Square 47. 80 lights

52
43
230
230
555
40 sidewalks.
595 Total.

115.
52
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1037.1 ft from + q no 47
to + q no 22

115.
22.2
66.6
163
44.9
240.
124.5
51.4
157.5
985.1 ft from − q no 47
to − q no 22

[illegible]

Square 48. 230 lights

185
177
234
240
836
40 sidewalk
876 Total

117.
175.
66.6
177.
44.9
176.
124.5
51.4
157.5
1079.9 ft front + of no 48
to + of no 22

120.
66.2
177.
44.9
176.
124.5
51.4
157.5
917.5 ft front − of no 48
to − of no 22.

Square 49. 200 lights

148
115
244
250
757
40 sidewalk
797 Total.

122.
48.11
68.33
166.
49.9
49.1
193.
44.8
791.24 ft front + of 49
to + of no 22

125.
48.11
155.
215.
49.9
155.
49.1
193.
44.8
1037.91 ft front − of no 49
to − of no 22.

Tale

Square 50. 150 Lights

222
225
198
187
832
40 sidewalks
872 Total.

99.
51.
70.5
92.6
158.
215.
49.9
155.
49.1
193.
44.8
1177.9 ft from + of 50
To + of 22

93.5
50.4
194.
70.5
92.6
158.
215.
49.9
155.
49.1
193.
44.8
1365.8 ft from - of [illegible] 50
To - of [illegible] 22

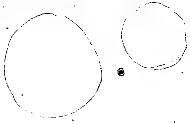
Square 51. 140 Lights

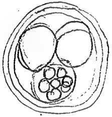
285
286
160
140
871
40 sidewalks.
911 Total.

62.
93.5
50.4
194.
70.5
92.6
158.
215.
49.9
155.
49.1
193.
44.8
1437.8 ft from + of 51
to + of 22

70
285.
50.4
145.
60.1
194.
100.3
79.
215.
49.9
155.
49.1
193.
44.8
1690.6 ft from - of 51
to - of 22

[illegible]





Sept 9 1880 TAE—

Length of distributing tubes —

~~1199~~

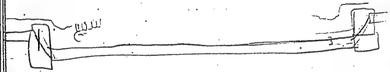
D 599.

DM. 599.

M 39

	Distributing	Wire	Distributing & Main	Main.	~~Main for~~ ~~[illegible]~~
Block 1	599.		599.	39.	
2	546.	1	546.		

51



6

Oct 15 1880

Distributing.

599
546
570 — 1715
545
633
493 — 1671
283
513
619 — 1415 — 4801
529
700
641 — 1870
890
226
684 — 1800
122
676
394 — 1692 — 4862
433
520
341 — 1294
125
507
564 — 1196
706
204
440 — 1350 — 716
710 — 3840
356 — 5502 — 3
448 — 1514 — 4862 — 4
345 — 4801 — 3
227 — 1098
425 — 997 — 1098
415 — 1204
516 — 530
367 — 1298 — 23651
230 — 2
308 — 47302
155 — 693 — 53502

155

466
180
70 — 716

370
432
296 — 1098

363
297
438 — 1098

398
436
370 — 1204

530

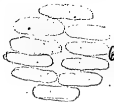
Oct 15 1880

23650.

56.

Total

950
60
35



67
9
603

21) 1700 (80
168
20

28) 2900 (100
28
10

23651
47302
75
236510

56) 3500 (62½
336
140
112
28

47302 40
1892080

21) 1700 (80
168
2900

28

21

2

17 40
3

17.

21

Oct 15 1880

34
18
272
34
612

46) 75 (1
46
29
6

750

750
46
29

67
7
469

21
25
105
42
525

$$7 \overline{)168}$$
24

$15 \overline{)84}(5$
75
9

15
7
105

15.

8

15
5
75

1
2 3 4
8 5
7 6
9 14 13
10 11 12

Oct 15 1880

14
7
98

14
7
98

1500

$50 \overline{)5000}(100.$
50
0

2 100.
$2\frac{1}{2}$ 80
3. $62\frac{1}{2}$
4 100.

67
33
100

50

18. $1\frac{1}{2}$

17.

2 inch pipe. c 17 . 21/170/8 mills
168
2
21 wires, (16) 3 of 7

2 1/2 pipe, - c 29 . 28/290/10 1/2 mills.
252
28 wires,

3 inch pipe - 35 56/350/6 6 1/4 mills
336
14
56 wires.

4 inch - cents - 50. 98/500/5 mills. 5 mills per wire
490.
98 wires.

Oct 15 1880
TAE

Cost of 47.302 feet distributing pipes 2 inch diameter (no mains) 17c for pipe 17c for rubber 34 Cents.

$16,082.68/100

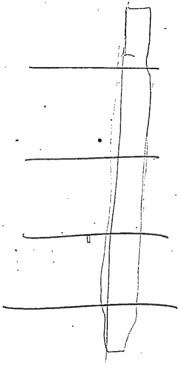
Oct 15 1880
TAE

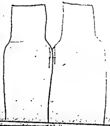
Mains + Dis + Main

w Wires.	feet.
11 + D	620

Oct 18 1880

TAE

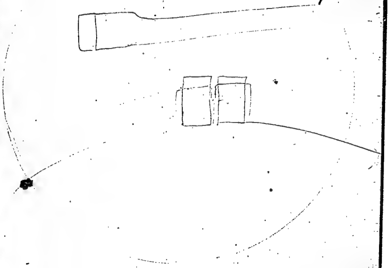


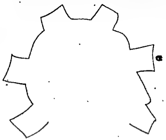


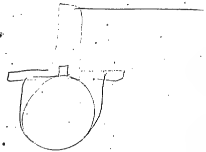
Total of distributing pipes
without mains —

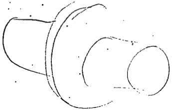
.23651.

Oct 15 1880
TAE



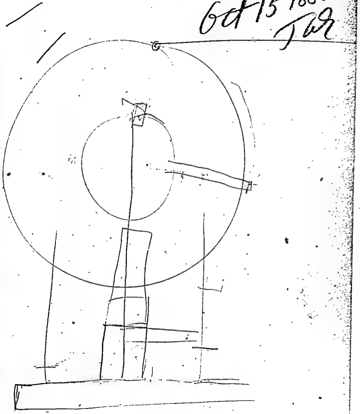




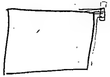


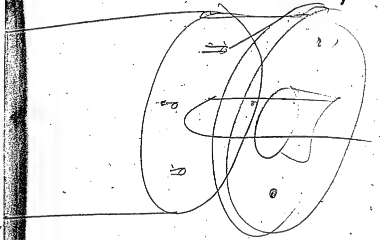
Weights of [illegible] lines

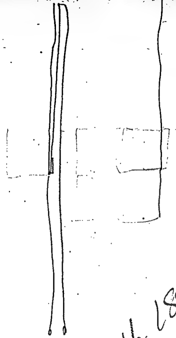
Oct 15 1880
TAE



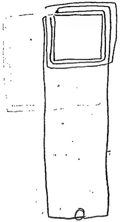
Oct 15 1880
TAE







Oct 16. 1880
TAE

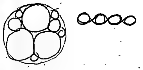


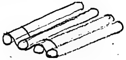
Oct 16 1880
TAE

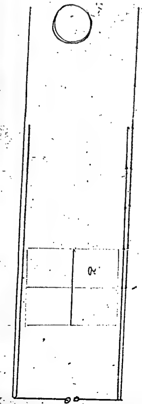
123.

80

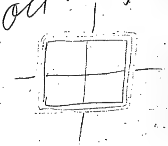
#229







oct 16 1880
TAE



1.2825. No 25.

.5460 - 28

11

22

47302
22
94604
94604
1040644

190

6

16

$6\frac{1}{3}$

13 cents

12

47302
13
141906
47302
614926.

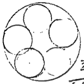
52
52
104
260
2704
10816
10816

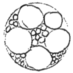
118976.

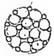
16.
22
35.

$1\frac{1}{2}$

54
54
216
270
2916
11664
11664
128304







Oct 16 1880 TAE

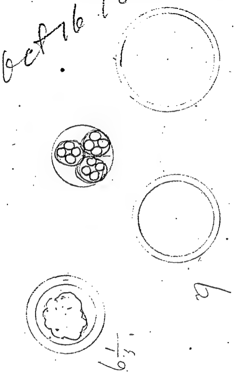
8 wires

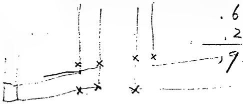
12
9

14.

13/20

Oct 16 1880 TAG





.6615
.2940
.9555

.7326
.3596
1.0832

6934
7326
1.4260

.2997
.7326
1.0323

2820
6750
9570

+ .9754
.6750
1.6504

97

.7582
.6750
1.4332

	No Feet	Cross Section 100 Ohms	No. Wires ~~100 Ohms~~	Size 200 Ohms
1.	1858	.6615		24
	410	.9953		36
	203	.9555		34
	20	.3338		12
	20	.2940		10
2	1538	.7326		26
	202.5	1.0832		39
	157	1.4260		50
	157	.5092		18
	612	1.0323		37
+	14	.6934		24
−	14	.5092		18
3	1400	.6750		24
	207	.9570		34
	157	1.6504		59
	157	1.4332		54
	205	.2490		9
+	16	1.2508		44
−	16	1.0098		36

~~7226~~
·7480
.2754
1.0234

1.250
7480
1.4980

2516
7480
9996

1.0098
.7480
1.7578

.2820
1.040
1.3220

1.52684
1.040
2.56684

1.0418
1.04
2.0818

3085
1.040
1.3485

2070
1.040
1.2470

987

2

.5125
.1750
.6875

2925
5125
7250

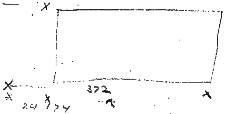
	Feet	Cross section		No Wires 200 Ohms.
4	2549	.7480	—	26
	207	1.0234	—	36
	10.0	1.9980	—	71
	100	1.7578	—	62
	205	.9996	—	36
	41	1.25088	—	44
	41	1.0414	—	37 KAE
5	1876	1.040	—	87
	210	1.3220	—	47
	386	2.5668	—	91
	386	2.0818	—	74
	202	1.3485	—	48
	202	1.2470	—	The 44 struck down not counted
6	1540	.5125	—	18
	218	.7250	—	26
	158	.6875	—	24
	24	.2125	—	8
	24	.1750	—	6

.2880
.0960
.3840

3

1.2438
~~.2880~~
1.5318

348
24
372



.271
1.150
1.421

.215
.42
.635

.42
.266
.686

.826
1.150
1.976

~~88~~

.736
.42
1.156
1236
[illegible]
1256
195
180
1633

~~1.002~~

1.041
.420
1.461

.524
1.150
1.674

186
198

.465
1.150
1.615

	Feet	Cross section	201 Ohms
7.	1012	.2880	10
	160	.3840	13
	174	1.5318	55
	174	1.2438	44
	372	1.1399	40
	24	1.2438	44
	24	.0960	4
8	1589	.420	2
	200	.686	3
	199	.635	3
	130	1.556	41
	130	1.461	52
	34	1.022	36
	34	1.041	37
9	1633	1.150	41
	198	1.615	57
	180	1.674	59
	195	1.421	51
	195	1.976	70
	20	.736	3
	20	.826	3

Not

1589
50
193
20
1862

1059
524
50
193
20
1846

.271
.483
.754

193
20
10
150

1054
.316
1.370

301
.483
.784

1,054
.355
1.409

12

.9360
.284
1,1220

~~.930~~
~~.260~~

.352
.936
1.288

.255
.936
1,191

.386
.936
1. ~~292~~
1.242

.640
.936
1.576

	Feet	Cross Section	No Wires
10	1846	.4830 —	17
	179	.754 —	27
	373	.784 —	28
	30	.271 —	10
	30	.301 —	11

Take

11	2298	1.054 —	37
	461	1.409 —	50
	256	1.371 —	49
	20	.355 —	13
	20	.316 —	11

12	1819	.9360 —	33
	257	1.220 —	43
	260	1.191 —	42
	118	1.576 —	56
	118	1.2~~42~~ —	44
	14	.639 —	23
	14	.571 —	20

.832
.218
1.050

.571
.832
1.403

.8572
.832
1.689

81½
10
91

81

Feet Cross section

13	2100	.832	30
	260	1.050	87
	135	1.403	30
	135	1.689	60
	32	.857	30
	3.2	.571	20
	11.0	.108	4
14	738	.045	2
	91	.0250	1
	100	.0255	1
	32	.0250	1
	32	.0253	1
15	1675	.5920	21
	181	.1248	4
	121	.0576	2
	10	.1499	5
	10	.1343	5

1247

16.

1183 — .1705 — 6
325 — .04440 — 2
71 — .0232 — 1

285 — 1.7668 — 62
255 — 1.3701 — 48
24 — 1.5963 — 56
24 — 1.3469 — 48

17.

2422 — .7800 — 25
.177 — 1.1138 — 40
191 — 1.1842 — 42
251 — 1.5963 — 57
191 — 1.1842 — 42

18

1096 — .1240 — 4
139 — .1760 — 6
139 — .1832 — 6
138 — .5378 — 19
130 — .5554 — 20
20 — .4138 — 15
20 — .4314 — 15

19

1226 — .3780 — 13
141 — .5256 — 19
145 — .5592 — 20
105 — .7398 — 26
105 — .7566 — 27
30 — .3618 — 13
30 — 3786 — 13

20

1561 — .4620 — 16
159 — .66~~70~~76 — 24
170 — .67 — 24
201 — .1980 — 7
201 — .6776 — 24

21

1595 — .5460 — (19) above 15 — (65) 1.8463
1.5 — (82) 2.30611
127 — .6058 — (21) 15 — (84) 2.3688
133 — .6184 (22) below 15 — (66) 1.87705
above station: 15.2 — 2.38634 (85)
15.2 — 2.85211 (101)
below station: 15.2 — 2.91455 (103)
15.2 — 2.42503 (86)
15
15

22 A0R

only 1/2	495'	2730	10
left side above	167	1.8403	65
	167	2.3061	82
right side above	195	2.36855	84
	195	1.87985	66
left side below	167	2.36853	84
	167	1.87905	66
right side below	195	1.2822	46
	195	1.8180	64
	25	2.5340	90
	25	2.6313	93

23.	1436.	.6110	~~22~~
	87.	.6474	23
	144.	.7280	26
	355	.5239	19
	355	.7770	27
	28	1.1349	40
	28	1.388	49

24. Nov

4459 — .6750 — 24
153 — .8250 — 29
195 — .8850 — 31
238 — 1.1725 — 42
238 — 1.3350 — 47
31 — .4875 — 17
31 — .6600 — 24

25.

2179 — 1.2825 — 45
199 — 1.62 — 57
224 — 1.732 — 61
295 — 1.6200 — 58

26.

1894 — .6090 — 22
170 — .6554 — 23
158 — .6679 — 24
213 — 1.2822 — 46
213 — 1.8185 — 64
28 — .2624 — 9
~~2881 — .3308 — 1[illegible]~~

The next two pages
scribbled on were torn out
by Hammer, contained
nothing important. —

ABR

27.	1592 —	.4305 —	15
	121 —	.5187 —	18
	119 —	.5481 —	19
	23 —	.1742 —	6
	23 —	2132 —	8
		.5460 —	19
28.	1823 —	.1781 —	6
	152 —	.3176 —	11
	175 —		
29.	1128. —	.22475 —	8
	278 —	.35655 —	13
	94 —	.33480 —	12
Street	15 —	.13175 —	5
	15 —	.11085 —	4

30.	1404	.576	20
	361	.9968	28
	116	.7424	26
	142	.92855	33
	142	.75245	26
	67	.35255	13
	67	.17645	6
31.	955	.224	8
	126	.2992	10
	133	.2880	10
	108	.65175	23
	108	.46445	16
	17		
	17		
32.	1444	.2960	10
	232	.3568	13
	264	.3520	13
	260	1.4404	51
	260	1.2594	45
	30	2.36855	84
	30	1.87985	42

33.

1024 — .2960 — 10
87 — .2985 — 10
58 — .3285 — 11
307 — .5712 — 20
307 — .5831 — 21
28 — .3162 — 11
28 — .3281 — 11

34.

1059 — .2550 — 9
100 — .3405 — 12
93 — .3660 — 13
239 — .5277 — 19
239 — .3660 — 13
29 — .2727 — 10
29 — .1110 — 4

35.

1609 — .1033 — 4
94 — .6912 — 24
82 — .7512 — 27

36.

1161 — .2610 — 9
89 — .4518 — 16
88 — .4230 — 15
14 — .1908 — 7
14 — .1620 — 6

751 — .0955 — 3
88 — .1756 — 6
37. 87 — .1711 — 6
79 — .3664 — 13
79 — .3331 — 11
13 — .2709 — 10
13 — .2376 — 8

38. 818 — .1920 — 7
86 — .2251 — 8
85 — .2091 — 7
155 — .5925 — 21
155 — .5430 — 19
43 — .4005 — 14
43 — .3980 — 14

39.

TAE

	698	.0945	3
	88	.1549	6
	91	.1413	5
top end of block	100	.6554	20
	100	.4925	18
across the street	22	1.0836	39
	22	.8794	31
side on which other mains pass	183	.5618	20
	183	.5482	19

40.

400	.1395	5
91	.1917	7
91	.1791	6
197	.3462	12
197	.3493	12
25	2067	7
25	2098	7

41.

1012 —	.2325 —	8
93 —	.3015 —	11
89 —	.3285 —	11
235 —	.7948 —	28
235 —	1.1630 —	41.
72 —	.2574 —	9
72 —	.3102 —	72

42.

1368 —	.1740 —	6
80 —	.2676 —	9
80 —	.2772 —	10
214 —	.4314 —	15
214 —	.4842 —	17
40 —	.2574 —	9
40 —	.3102 —	11

43.

1513 —	.3330 —	12
82 —	.4968 —	17
82 —	.5400 —	20

44. [illegible]

+

	1356 —	.3960 —	14
	117 —	.6688 —	24
	120 —	.6336 —	22
	214 —	.6688 —	24
No-main	14 —	.2728 —	10
	14 —	.2376 —	8

45.

764 —	.1080 —	4
121 —	.2034 —	7
121 —	.2018 —	7
79 —	.4762 —	17
79 —	.4374 —	15
13 —	.3682 —	13
13	.3294 —	12

46.

1001 —	.1740 —	6
121 —	.2940 —	10
123 —	.2820 —	10
143 —	.6622 —	23
143 —	.6114 —	22
64 —	.4882 —	17
64 —	.4374 —	15

Tae

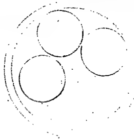
47	875	.0960	3
	125	.1632	6
	125	.1600	6
	72	.6714	24
	72	.6114	22
	47	.5618	20
	47	.5018	18
48.	1374	.4500	16
	334	.6567	23
	130	.6202	22
	205	.6567	23
	30	.2067	7
	30	.1702	6
49	1403	.3200	11
	187	.4480	16
	125	.4880	17
	28	.1280	4
	28	.1680	6

50. TAE

1558 —	.2700 —	10
107.	.4125 —	15
103	.4365 —	15
30	.3049 —	11
30	.1665 —	6

	1487 —	.2590 —	9
51.	at point grating block	.4012 —	14
	385 —	.4508 —	16
	30 —	1422 —	5
	30 —	1918 —	7

2 inch 28 wires



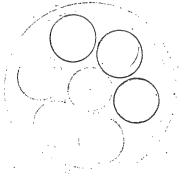
TAE

Oct 16 1880

inch

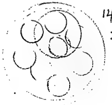
7 wires

$2\frac{1}{2}$ inch 49 wires



$1\frac{1}{2}$

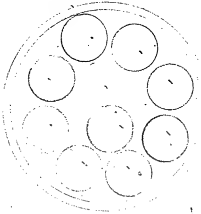
14 wires
2=7s



3 inch

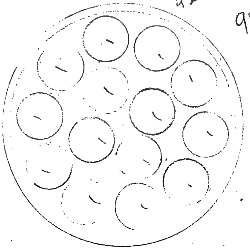
70 wires

Oct 16
1880
TAE

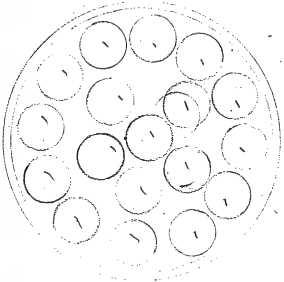


3½ inch

98 wires



Oct 16 1880
Tgt
4 inch
126 cones



$3\,)\,16632$
5544

$\frac{1}{3}$

95

$$\begin{array}{r} 16632 \\ 6 \\ \hline 99792 \\ 5544 \\ \hline 1.053.36 \end{array}$$

$$\begin{array}{r} 18121 \\ 11 \\ \hline 18121 \\ 18121 \\ \hline 1.9933 \end{array}$$

$$\begin{array}{r} 1262 \\ 32 \\ \hline 2524 \\ 3786 \\ \hline 403.84 \end{array}$$

$$\begin{array}{r} 2201 \\ 32 \\ \hline 4402 \\ 6603 \\ \hline 704.32 \end{array}$$

$$\begin{array}{r} 386 \\ 42 \\ \hline 772 \\ 1544 \\ \hline 162.12 \end{array}$$

18487

$$\begin{array}{r} 3064 \\ 25 \\ \hline 15320 \\ 6128 \\ \hline 766.00 \end{array}$$

$$\begin{array}{r} 1129 \\ 42 \\ \hline 2258 \\ 4516 \\ \hline 474.18 \end{array}$$

6162

$$\begin{array}{r} 304 \\ 50 \\ \hline 152.00 \end{array}$$

$$\begin{array}{r} 18487 \\ 15 \\ \hline 92435 \\ 18487 \\ \hline 277305 \\ 6162 \\ \hline 2.834.67 \end{array}$$

125

$$\begin{array}{r} 3\,)\,24017 \\ 15 \\ \hline 120085 \\ 24017 \\ \hline 360255 \\ 8.00 \\ \hline 3.610.55 \end{array}$$

$$\begin{array}{r} 329 \\ 42 \\ \hline 658 \\ 1316 \\ \hline 138.18 \end{array}$$

$$\begin{array}{r} 25 \\ 42 \\ \hline 50 \\ 100 \\ \hline 10.50 \end{array}$$

$$\begin{array}{r} 1999 \\ 32 \\ \hline 3998 \\ 5997 \\ \hline 639.68 \end{array}$$

$$\begin{array}{r} 11661 \\ 25 \\ \hline 58305 \\ 23322 \\ \hline 2.915.25 \end{array}$$

$$\begin{array}{r} 4690 \\ 25 \\ \hline 23450 \\ 9380 \\ \hline 1.172.50 \end{array}$$

Sizes of pipes on the plan of working Each Block - seperate

1.053.36	16632	1 inch.
1993.31	18.121.	1½ inch
2,834.67	18487.	2 inch
3.610.55	24017	2 inch
766.00	3064	2½ inch
2 915 25	11661	2½ inch
1 172 50	4690.	2½ inch
~~704~~ 32	2201	3 inches
639.68	1999	3 inch
403 84	1262	3 inch
162 12	386	3½ inch
474.18	1129.	3½ inch
138 18	329	3½ inch
10 50	25	3½
152 00	304	4 inch.
16770 46	104307	

Oct 16 1880

5544576

$$\begin{array}{r} 16770.46 \\ 2 \\ \hline 33540.92 \\ 22000 \\ \hline 55540 \end{array}$$

71 Lamps
1267 — 270 —
50
90
20
20
70
70
20
75
705 lamps

.10 | 705
70

201.5
70
1410.50

Oct 16 1880
TAE

71
920.

50
150
20
20
70
70
40
40
150
80
80
40
50
30
100
30
100
50
1150 lamps

10 | 1150.
115

115
105.8
920
115
124 2.0

91-
669.

60
110
100
40
50
20
20
50
90
50
40
630

10 | 630
63

63
49.6
378
567
252
3124.8

Oct 16 1880
Tex

1082.

80
60
60
10
10
20
150
20
40
150
30
50
80
40
800

10 | 800
80

80
72.31
5784.80

$\overset{\text{ft}}{1466.}$

Lamps

120
100
90
40
60
30
80
30
[illegible]
[illegible]
30
50
[illegible]
[illegible]
80

970

Thl

$$10\,\overline{)\,97.0\,}\quad 97$$

$$\begin{array}{r} 270.1 \\ 97 \\ \hline 18901 \\ 24309 \\ \hline 26199.1 \end{array}$$

884.

100
100
100
150

450

$$10\,\overline{)\,450\,}\quad 45$$

$$\begin{array}{r} 96.8 \\ 45 \\ \hline 4840 \\ 3872 \\ \hline 4356.0 \end{array}$$

848.

Lamps

80
50
50
80
80
40
380

$$10 \overline{)380}$$
3.8

TW

90.3
38
7224
2709
3431.4

407.

30
200
40
270

Lamps.

220.

50
20
50
40
60
50
10
60
50
40
10
10
450

$$10 \overline{)450}$$
45

6.05
45
3025
2420
272.25

$\frac{H}{20.}$ Lamps

KVR

396. Lamps

10
100
50
70
40
30
40
360

$10/360$
36
20.
720.

91
765.

Lamps

140
40
70
40
150
80
75
100
40

735

40

10/735
73

72.2
73
2166
5054
5270.6

4 ph

91
1162

140
90
40
30
60
40
150
620

10/620
62

168.
62
336
1008
10416

9/1 Lamps

794.

50
80
50
160
90
80
70
120
700

10|700
70

78.0
70
5460.0

5

9/1

225.

50
60
180
60
10
10
60
100
80
610

10|610
61

6.05
61
605
3630
369.05

71
660

Lamps
90
150
80
200
150
670

Kue

$$10\overline{)670}$$
67

54.4
67
3808
3264
3644.8

71
758

70
70
60
60
60
150
410

$$10\overline{)410}$$
41

72
82
287
2952

71
1102

20
80
20
120
60
140
440

$$10\overline{)440}$$
44

151.2
44
6048
6048
665.28

KvR

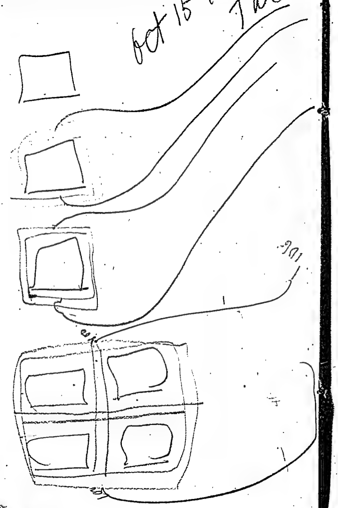
1410.50
1242.
3124.8
5784.8
26199.1
4356.
3431.4
272.25

2.11-Blanks

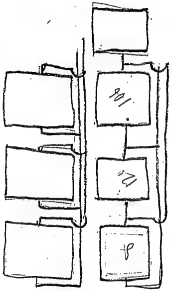
720.
5270.6
10416.
5460.
369.05
3644.8
2952.
6652.8

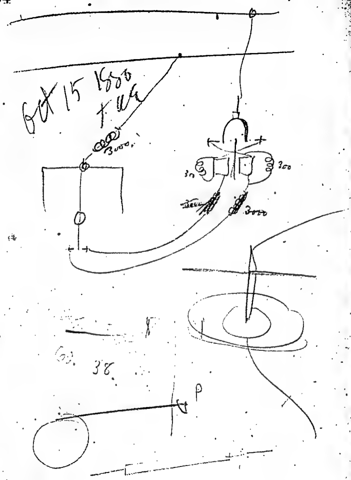
81306.10 Total miles

Oct 15 1880
TAE

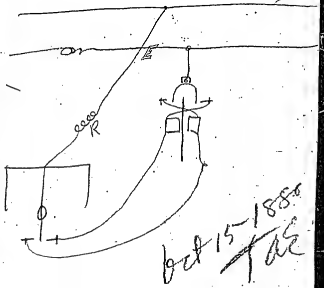


Oct 15 1880
TAE





, 01409 .01409



Menlo Park Notebook #130 [N-81-00-02]

This notebook is undated but was probably used late in 1880. All of the entries are by Otto Moses. They probably relate to books and periodicals that were to be ordered for Edison's library as a result of Moses's search for literature about the electric light. Included also are a few clippings relating to technical publications. The label on the front cover is marked "Book & Periodical" and "Orders & Memoranda." The book contains 284 numbered pages.

Blank pages not filmed: 2-3, 18-284.

Chemistry. Essai de Méchanique Chemique fondée sur la Thermochemie
M. Berthelot II., Vols. (Paris. Dunod.)

Catalogs. Westermann, B., Broadway N.Y.
Catalogue of foreign publications and periodicals.
received

" Christern —., University Place N.Y.
Catalogue of foreign publications and periodicals. He has been appointed by Paris house to receive subscription to Comptes Rendus.
Ordered

Electricity Gordon, Electricity & Magnetism.

Chemistry. Chemical Physics, Heat, Light and Electricity. 550 pages $3.00.
Pynchon, T. R. (250 Engravings)

Chemistry Fresenius, Zeitschrift der Analyt. Chem.

Electricity. The employment of Electromagnetism
Steinheil, 1873. (German)

Electricity Electro technical Journal (German)
Zetzsche F. K. Ed. Editor.

✓ . Wiener Akadamie Anzeiger.

Electricity The latest advances in the province of
electric lighting and transmission of power.

" The electric transmission of power.
Higgs, Paget. E & F. N. Spon.

Technological Dictionary E. French & Germ.
Tolhausen, Alex.
✓ Tauchnitz, Leipzig.
Sampson Low & Co. London.

✓ Thompson & Tait's Natural Philosophy

Miller's Chemical Physics.

Maxwell's Electricity and Magnetism.

Wormell's Dynamics.

√ Common sense for gas users.
Robt Wilson.... 2nd Ed.

Asa Gray's Flora of the U.S.

The fibrous plants of India [1855.]
Dr. Forbes Royle. also a paper by
Dr J. Forbes Watson. May. 9. 1860
on the same subject. Dr W. is Reporter
on the Products of India.

Four lectures on static induction.
Gordon, J.E.H.

Culley's Hand book of Electricity?

Technical Dictionary in English.

= Holzappfel. 3 first vols.. at Wiley's I own copy

Airy, G.B. A treatise on magnetism.

√ Les Mondes.

The choice of books.
Chas. F. Richardson
To appear from American Book Exchange

—

✓ Wiedermann's Galvanismus + Magnetismus

—

Clerk-Maxwell–

—

✓ Poggendorf's Handwörterbuch, Biogr.

—

"Japan." Sir Edwin J Reed. K.C.B.
"almost profusely illustrated

✓ Miller's, Chemical Physics.

—

Royal Institution Proceedings

—

✓ La physique moderne. Les principales applications de l'Electricité.
E. Hospitalier.
133 ~~plates~~ illustrations + 4 plates

Prof. Willis "Principles of Mechanism".

Culmann's "Graphische Statik".

The Principles of Graphic Statics. By G. S. Clarke, Lieut. R.E. London: E. and F. N. Spon. 1880.

This work will meet a want which has made itself felt for some time. Though the subject of graphic statics is valuable, not merely as a means to an end, but as a part of mental training, its study has not found much favour in this country. The graphic method is the complement of the analytical process, and the power conferred by it is at the disposal of those who have had but little mathematical training. In the great engineering schools of the Continent the subject is deemed worthy of a professorial chair, and it is systematically taught; in England, on the contrary, it is left to the teacher to introduce it in an almost haphazard way. The author has endeavoured in the present work to avoid the abstract character of the numerous foreign treatises and the too practical treatment the subject has received in England. He trusts that it may lead some of his readers to a further prosecution of a fascinating study, in which much still remains to be done. The book has been very judiciously divided into ten short chapters; and the appendix which has been added contains tables giving the weights and strength of materials. By the help of these tables it will be found possible to apply the various constructions to actual practice. The plates which are given at the end of the book are very clear, and easy to follow. They help to make the work a valuable addition to the library of the engineer.

✓

Insect? Enemies (The) of Books. By W. Blades. 2nd edition. Crown 8vo. Trübner and Co.

"L'Electricité". 20 francs a year.

Electric Meteorology. By G. A. Rowell. Oxford: Slatter and Rose.

Popular Lectures on Scientific Subjects. By H. Helmholtz. Translated by E. Atkinson, Ph.D., F.C.S. Second series. London: Longmans, Green.

U. S. Patent Office.
Australia
Ferdinand Mueller

Vétillart – Sur les fibres végétales employés dans l'industrie
Paris et Londres
Firmin-Didot

Harrison and Sons, Printers, St. Martin's Lane.

Helmholz – Popular Lectures on Scientific subjects.

– –

Memoirs of the Academy of Sciences of France. Gauthier - Villars

XLII. Vols.

Menlo Park Notebook #131 [N-80-07-00]

This notebook is undated but was probably used late in 1880. All of the entries are by Otto Moses. The first five pages contain a list by subject of the first fifty-five volumes of the Menlo Park Scrapbooks. (See Menlo Park Scrapbook Series.) On page 101 is a list of pamphlets relating to technical subjects. The label on the front cover is marked "Library Catalogue." The book contains 284 numbered pages.

Blank pages not filmed: 6-99, 102-284.

M0131

Edison's Laboratory Note books.

General subjects.

1. + Batteries
2. + Combustion of Coal.
3. + Conductivity and resistance of matter.
4. + Electrolysis
5. + Etheric Force
6. + Electrical testing.
7. + Electricity and Railways
8. + Electricity and Electricians, history of.
9. + Electric Pen.
10. + Electro-metallurgy.
11. + Electric Light.
12. + Induction
13. + Insulation
14. + Illuminating Gas I.
15. + " " II.
16. + Magnetism of steel bars.
17. + Magneto-electric Generators.
18. + Phenomena, general.
19. + Phonograph
20. + Polarization and secondary batteries.
21. + Telephones, carbon.
22. + " magnetic.

General subjects (continued)

23.+ Tasimeter
24.+ Thermo-electricity
25.+ Telegraph apparatus
26.x " construction
27.x " submarine
28.x Telegraphy, automatic
29.x " fac-simile
30.x " duplex and quadruplex
31.x " fire alarm and burglar
32.x " not electrical
33.x The Laws of Electricity and Magnetism
34.+ Transmission of power.
35. Vacuum Pumps and Radiometer
36 Motograph
36.+ Lightning protection & atmospheric
37.x Electricity
38.x Static Induction
39. Aerostatics
40.+ Electric machines in general.
41. Carbon.
42. General scrap book
43. Spectroscopy
44.+ General telegraphic matters.

Pamphlets

Report on the Cherokee Flat Blue Gravel & Spring Valley Mining & Irrig^n Co's Property.
Stretch, R. H., M.E. 1879. p. 16.

Summer Excursion Routes Penn. R. R. p. 166

Revue des Industries chimique & agricoles
Tome III., N° 34.

Observations on Mount Etna.
Reprint Am. Journ. Sci. July 1880
Langley S.P.

Menlo Park Notebook #132 [N-80-08-13]

This notebook covers the period August-December 1880. Most of the entries are by Francis Upton and Hermann Claudius. There are also a few entries by Edison. The material by Edison includes notes and drawings of electric meters. The material by Upton (who was assisted by another laboratory worker, possibly William Hammer) includes notes and calculations relating to lighting and power consumption in the Pearl Street district, based on statistics from the New York survey books. The material by Claudius also includes calculations, tables, and notes on lighting and power consumption in the first district, based on the survey books. An index to Claudius's entries appears on page 130. The label on the front cover is marked "Dist 1 N York. see volume labeled 'New-York City' By 'Districts' Index folio-130." Another label is marked "Meters" and "N.Y." The book contains 284 numbered pages.

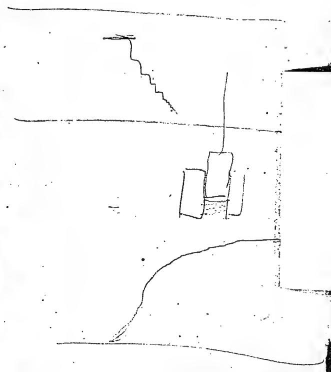
Blank pages not filmed: 98-99, 118-123, 206-209, 236-239, 256-284.

DIST 1 N YORK.
see volume
labeled
"NEW-YORK, CITY"
BY
"DISTRICTS"
Index folio - 130

95

From the Laboratory
of
T. A. EDISON.
MENLO PARK, N. J.
188
No. 4

N-80·08·13



1

TAE Aug 13/1880

Use a Dynamo bobbin, in a shunt from the house circuit as we now use our [illegible] cell

~~or ever Compt chain in which~~ ~~to glycerine~~ two or 3 cogs wheels with a Revolving Chain filled with glycerine a Regular Counter gives the Revolutions in a month, the Rev being proportionate to the [illegible]

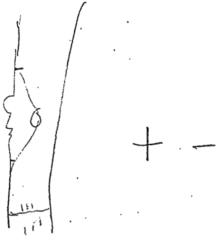
81

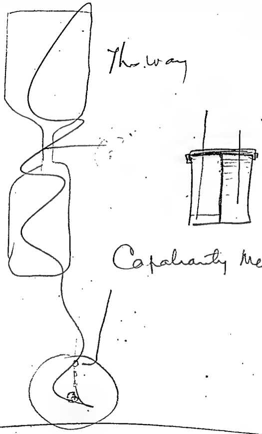
TAE Aug 13/1880

Use a Dynamo bobbin, in a shunt from the house circuit as we now use our Copper cell. The field Magnet should be large & multiple arc'd in the mains, having such high Res that it would give current up to near saturation. The Bobbin is connected by say ~~worm and wheel with a dash or revolving chain in which [illegible]~~ two or 3 gear wheels with a Revolving Chain filled with glycerine. A Regular Counter gives the Revolutions in a month, the Rev being proportionate to the

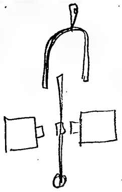
Vallometer, in place sum
Copper Cell -

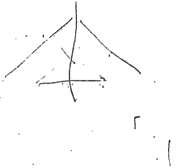
A Dynamo bobbin in place
of Dolbears axial magnet
& paper Drums an arm
from Dynamo bobbin has pencil
touching paper; a spring
prevents bobbin twisting around
more than 3/4 of a Revolution
work this up with a Counter.
If paper record is used. a Electric
Motor governed by a pendulum
could be used to give
motion to the paper to get
the Timing

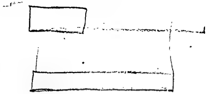




Water meter - with a trip worked by a 3/4 turn Dynamo Bobbin







~~Note~~ Having a 0″.008 X 0″.012 carbon giving 2 candles to find the size of one to give 12 candles in same circuit. or any number of candles

.017 × .008 = .000136

.017 × .009 = 153

138 : 153 :: 1820 :

3.2601
2.1399
1.1202
2.1847
3.3049 2010 fhk
1.3979 log 25
8.5850 comp 26
3.2878 1940

17
8
25 26

1940

2.25	.3522
	1.4150
	8.1602 1
2.34	.3693

17
10
170

	1.1202
	2.2304
	3.3506
	1.3979
	8.5686
2078	3.3171
3.	.4771
	8.6021
	1.4314
3.24	.5106

17
11
17
17
187

1,1202
2.2718
3.3920
1,3979
8.5528
3.3427

2460
~~3100~~

28

4

2200

3.4

0.5315
8.6021
1.4472
.5808

3.8

17
12
34
17
204

17
12
29

1,1202
2.3096
1.3979
8 5376
3.3653

1,1202
1.3979
2.5181

2310

4.1

0.6128
8.6021
0.4624
9.6773

47

14
17
98
14
238

31

2,5181
2.3766
8.5086
3.4033

2530

5.25 0.7202
8.6021
1.4914

6.5 .8137

16
17
112
16
272

16
17
33

2.5181
2.4346
8.4814
3.4341

27.20.

6.3 0.7993
8.6021

8.3 9.5185
.9199

18
17
126
18
306

18
17
35

2.5181
2.4857
8.4559
3.4597

2880

7.7
0.8865
8.6021
1.5441
10.7
1.6327

22
18
176
22
396

18
22
39

2.5181
2.5977
8.3979
3.5137

3260

12.2
1.0864
8.6021
1.6021
19.6
1.2906

~~97.5 1.9890~~ 96 1.9823

1.9890 1.9823

1.6464 1.6464

~~156 7.8669~~ 7.8027

2700 3.4313 3.4137

103 2,0128

2.0128

1.6464

156 7.8069.

3010 3.4789

18
20
340

2.5181
2.5563
8.4202
3.4946

3/20

9. 0.9542
8.6021
1.5798
1.1361

13.7

17
20
340

1.1202
2.5315
3.6517

4.5185
3.6517
.9668
9.3 per H.P.

4480

1.3979
8.4318
3.4814

3030

9 0.9542
8.6021
1.5682
1.1245

13.3

022
17
154
22
374

1.1202
2.5729
.6931

None of these calculations are right for a lamp with increased cross section does not only takes as many times the ft. lbs. as its cross section is greater but more owing to the fact that it decreases its resistance

Standard Burner

$0''.012 \times 0''.012 \times 6''$

What will $0''.017 \times 0''.017 \times 6''$ give

$\frac{34}{24}$ times the light with same temperature

$\frac{34}{24}$ times the ft. lbs.

$$\begin{array}{r} 17 \\ \underline{17} \\ 139 \\ \underline{17} \\ 309 \end{array}$$

$\frac{144}{309}$ the resistance

$\sqrt{\dfrac{\frac{34}{24}}{\frac{144}{309}}}$ times the E.M.F

$$\frac{\mathcal{E}^2}{r}44.3 = \text{ft lbs}$$

$$\mathcal{E}^2 = \frac{\text{ft. lbs} \times r}{44.3}$$

$$\mathcal{E} = \sqrt{\frac{\text{ft. lbs} \times r}{44.3}}$$

No. 1 Standard $0''.012 \times 0''.012 \times 6''$.
when cut

No. 2 Other $0''.00m \times 0''.00n \times 6''$
What candle power

Let a = candles from Standard
R = Ohms standard
$\mathcal{E}$ = E.M.F. on standard

$$d = \frac{\mathcal{E}^2 44.3}{R} = \text{ft. lbs on standard}$$

Same temperature loop

$\frac{m+n}{24}a$ = candles from No. 2

$\frac{144}{mn}R$ = resistance No. 2

$\frac{m+n}{24}d$ = Ft. lbs. of No. 2

$$\sqrt{\frac{\frac{m+n}{24}d \times \frac{144}{mn}R}{44.3}} = \text{E.M.F. No. 2}$$

$\frac{\mathcal{E}^2}{R} 44.3 =$ ft. lbs

$R = \frac{\mathcal{E}^2\ 44.3}{\text{ft lbs.}}$

$$\begin{array}{r} 17 \\ 17 \\ \hline 139 \\ 17 \\ \hline 309 \end{array}$$

$$\begin{array}{r} 2.0128 \\ 2.0128 \\ 1.6469 \\ 6\,5086 \\ \hline 2.1806 \end{array} \qquad 151.$$

$$\begin{array}{r} 1.53155 \\ 1.3802 \\ \hline .1513 \\ 3.4914 \\ \hline 3.6427 \\ 1.8490 \\ 8.3536 \\ \hline 3.8453 \\ \hline 1.9226 \end{array} \qquad \begin{array}{r} 2.1584 \\ 7.5100 \\ 2.1806 \\ \hline 1.8490 \end{array}$$

$a = 10$ candles

$d = 3{,}100$ ft. lbs.

$\mathcal{E} = 103$ Volts

$R = 151$ Ohms

$m = 17\ \frac{1}{1000}''$

$n = 17\ \frac{1}{1000}''$

$\frac{m+n}{24} a = \frac{34}{24} 10 = 14.1$ candles

$\frac{144}{mn} R = \frac{144}{309} 151 = 70.6$ Ohms

$\frac{m+n}{24} d = \frac{34}{24} 3100 = 4390$ ft lbs

$$\sqrt{\frac{\frac{m+n}{24} d \times \frac{144}{mn} R}{44.3}} = 83.6 \text{ Volts}$$

$d = \frac{\mathcal{E}^2}{R} 44.3$

$a = f(d)$

$\frac{m+n}{24} f(d) = 15$

$\sqrt{\frac{\frac{m+n}{24} d \times \frac{144}{mn} f'(d)}{44.3}} = 100$

$$R = \frac{\mathcal{E}^2\, 44.3}{ft.\ lbs}$$

2.0233
2.0233
1.1646 4
6.4949
2.1877

154.5

2.1584
7.5884
$\bar{2}$.1889
1.9357

3.5872
1.9357
8.3536
3.8765
1.9382
1.9382
1.6464
8.0643
3.5891

31
103
41.3

3.6163
1.9357
8.3536
3.9056
1.9528

$a = 12$ candles

$d = 3200$ ft lbs.

$\mathcal{E} = 105.5$

$R = 154.5$ ohms

$m = 17$

$n = 14$

17
14
68
17
258

17
14
31

$$\frac{m+n}{24}\, a = \frac{31}{24}\, 12 = 15.5 \text{ candles}$$

$$\frac{144}{mn}\, R = \frac{144}{258}\, 154.5 = 86.2 \text{ ohms}$$

$$\frac{m+n}{24}\, d = \frac{31}{\cancel{24}_{\,3}}\, \cancel{3200}^{\,400} = 4133$$

$$\sqrt{\frac{\frac{m+n}{24}\, d \times \frac{144}{mn} R}{44.3}} = 89.7 \text{ Volts}$$

2.1584
7.6556
2.1875
2.0015

3275
814
4089

3.6116
2.0015
8.3536
3,9667
1,9833

$a = 13$
$d = 3275$
$\mathcal{E} = 166.7$
$R = 154$
$m = 17$
$n = 13$

17
13
51
17
221

$$\frac{m+n}{24}\, a = \frac{30}{24}\, 13 = \frac{5}{4}\, 13 = 16.25$$

$$\frac{144}{mn}\, R = \frac{144}{221}\, 154 = 100 \text{ Ohms}$$

$$\frac{m+n}{24}\, d = \frac{30}{24}\, 3275 = 4089$$

$$\sqrt{\frac{\frac{m+n}{24}\, a \times \frac{144}{mn}\, R}{44.3}} = 96.2$$

$a = \frac{48}{25} = 1.92$

2.1584
7.8665
2.2211

2.2460

1.3979
8.6198
3.2553

3.2730

2.2460
3.2730
8.3536

$\overline{)3.8726}$
1.9363

$a = 1.92$ candles
$d = 1800$
$\mathcal{E} = 82.2$
$R = 166.4$
$m = 17$
$n = 8$

$\frac{17 \times 8}{136}$ $\frac{17 + 8}{25}$

$\frac{m+n}{24} a = \frac{25}{24} a = 2$

$\frac{144}{mn} R = \frac{144}{136} 166.4 = 176$

$\frac{m+n}{24} d = \frac{25}{24} 1800 = 1870$

$\sqrt{\frac{\frac{m+n}{24} d \times \frac{144}{mn} R}{44.3}} = 86.4$

$\frac{5}{6}a = 2$

$5a = 12$

$a = 2.4$

2.1584
8.0177
2.2172

2.3933

$\frac{5}{6}$ 2000

$\frac{5}{3}$ 1000

333
5

1666

3.2219
2.3933
8.3536

3.9788

4.5185
3.2219

1.2966

19.8 per H.P.
2

38.6 candles per H.P.

$a = 2.4$

$d = 2000$

$E = 85$

$R = 164.9$

$m = 12$

$n = 8$

$\frac{m+n}{24} a = \frac{20}{24} a = 2$

$\frac{144}{mn} R = \frac{144}{96} R = 247$

$\frac{m+n}{24} d = \frac{20}{24} 2000 = 1666$

$\sqrt{\frac{\frac{m+n}{24} d \times \frac{144}{mn} R}{44.3}} = 95.2$ Volts

2.1584
7.6904
2.1889
2.0377

29
400
11600
3866

3.5872
2.0377
8.3536
3.9785
1.9892

1.9892
1.6464
7.9623
3.5871

3860

$a = 12$
$d = 3200$
$\mathcal{E} = 105.5$
$R = 154.5$
$m = 17$
$n = 12$

17
12
34
17
204

$m+n = 29$
$mn = 204$

$$\frac{m+n}{24}\,a = \frac{29}{24}\,12 = 14.5$$

$$\frac{144}{mn}\,R = \frac{144}{204}\,154.5 = 109.$$

$$\frac{m+n}{24}\,d = \frac{29}{\cancel{24}_{3}}\,\cancel{3200}^{400} = 3866$$

$$\sqrt{\frac{\frac{m+n}{24}\,a \times \frac{144}{mn}\,R}{44.3}} = 97.6$$

21)48(2.28
42
60
42
180

2.1584
7.9666
2.2180
2.3430

1.3222
8.6198
3.2911
3.2331 1710
2.3430
8.3536
3.9297
1.9648

$a = 2.28$
$d = 1955$
$\mathcal{E} = 84.5$
$R = 165.2$
$m = 12$
$n = 9$

$$\begin{array}{r} 12 \\ 9 \\ \hline 108 \end{array}$$

$$\frac{m+n}{24} a = \frac{21}{24} a = 2$$

$$\frac{144}{mn} R = \frac{144}{108} 165.2 = 220$$

$$\frac{m+n}{24} d = \frac{21}{24} 1955 = 1710$$

$$\sqrt{\frac{\frac{m+n}{24} d \times \frac{144}{mn} R}{44.3}} = 92.2 \text{ Volts}$$

11)24
2.18

16.54
12
3308
1654
19848

1.9227
1.9227
1.6464
7.7815
3.2733

1.0414
8.9208
3.2733
3.2355
2.2984
8.3536
3.8875
1.9437

4.5165
3.2355
1.2830

19.1 per H. P.

a = 2.18
d = 1870
E = 83.7
R = 165.4
m = 12

n = 10

$\frac{m+n}{24} a = \frac{22}{24} a = 2$

$\frac{144}{mn} R = \frac{144}{120} R = \frac{12}{10} 165.4 = 198.48$

$\frac{m+n}{24} d = \frac{22}{24} 1870 = 1720$

$\sqrt{} = 87.8$

2.0178
2.0178
1.6464
7.8097

3.4917 $\frac{455}{13.4}$
1.4771
8.6198

3.5886
2.0043
8.3536

3.9465
1.9232

2.1584
7.6556
2.1903

2.0043

$a = 11$

$d = 3100$

$\mathcal{E} = 104.2$

$R = 155$

$m = 17$

$n = 13$

$17 + 13$: $m+n = 30$ $\qquad$ $17 \times 13 = 51 + 17$: $mn = 221$

$$\frac{m+n}{24} 11 = \frac{30}{24} 11 = \frac{5}{4} 11 = 13.7$$

$$\frac{144}{mn} 155 = \frac{144}{221} 155 = 101 \text{ Ohms}$$

$$\frac{m+n}{24} d = \frac{30}{24} 3100 = 3888$$

$$\sqrt{\quad} = 84 \text{ Volts}$$

292.

24.3

2500
205

10

Book 1

2,00	4.
4,00	4
24.30	80
25.	55
.60	2
30.	350
10	7
1.25	5
18.	6
30	5
4.	580
2	22
2	20.75
1	3.
12	7
3	12.50
3	200
1.25	7
1.00	1.25
150	75
140	2.
4.	3.50
3.50	12.
3	6
3.50	1.
200	1.
4	1.
18	2.50
20	.75
2	3.50
30	6.
237.60	490.80

40
60
80
50
30
80
30
80
100
100
150
100
900

23760
490.80
345.50
268.75

2.25) 13426 5 (596
1250
1125
2176
2025
1515
1355
160

150

596

25

900
30
900
27,000
.25
135
54
675.000

Book 1

25
3
8
8
2
4
4
4
3
4
4
1.50
6
1
7
2
8
200
250
5.
1
1.50
2.50
10
1.
2.
11
1.50
2
1
345.50

3.50
75
4
3
2 50
11
50
1.50
1250
1
20
8
9
1
1.50
6
150
15
75
25
9
4
4
268.75

5 P.M
4 P.M 5
4 5
5
5
5
5.

6-30

Book 1 closing hours

6 6 7
6 5 30 7 P.M
6 6 6. 5 30 7 12 P.M
6 6 6 5 30 7 12
6 6 6 530 7
6 6 . 6 530
6 6 6 530 7
6 6 6 5 30
6 6 6 5 30
6 6 666 5 30 8 P.M
6 6 666 530
6 6 666 530 8.
6 6 66 570
6 6 666 530
6 6 666
6 6 66 10 P.M
6 6 66 10
6 6 666
6 6 666 All night
6 6 666
6 6 666
6 6 666
6 6 666
6 6 666 9
6 6 666 9
6 6 666
6 6 66
6 6 66

12
6
3
1
5
5
6
$ 38
1 50
6.
1 45.50

18
17
35

4, 5
4.

104

2

45
27.5
2
145

Book 1

Powers used

6
1
$ 2000.
1
6
5
2
2
2
20

$12 a week
$18 a month
$6 a week
$3 a week
$ 1.50
$1 a week
3 cts
3 cts
17 a month
$104 a year
$312 a year

.33
2.5
5
3.
14.
7.5
9.
5
9.
5
12
1.0
20

102.33
7

109. H.P.

Two hand presses
Two mach—
2. —
6
1
2
1
1
2
1
3
1
1
1
1
2
2

34

Book | Power used

— $5.00 a week
— 5.00 a week
— 300 a year
10
3 — 10 tons coal per month
— Horse for hoisting
2 Boston engines
2 tons per month
1
— $6.00 a week
3.5 Ton per month calcine
3.5 Calcine
1½ ton per mo
4.5 Calcine
1 ton per month

27.5

Book 1 Power used

Use horse

.5 $1.00 per week

.5 $1.00 per week

.5. For hunting.

.5

Engine 1 ton a week

2.

Book 1 Maximum burners

6
100 to six
50 but 430 & 5
8
3 all night

45	20	5
15	~~18~~	25
20	9	6
2	1	8
1	22	12
6	6	25
2	12	9
4	20	1
1	5	1
1	6	12
2	4	8
3	2	6
2	6	2
2	1	2
2	1	2
6	4	4
4		1
		4
		4
		20
275	129	157

365
25
1815
730
9115

30/596,000

938

250
127
157
129
275
938

Book 1 Maximum burners

4	4
4	6
7	4
2	12
2	25
10	1
60	1
3	12
2	1
1	20
2	16
4	20
6	2
1	20
2	6
6	2
2	8
2	30
1	16
4	20
1	12
	6
	6
127	250

average Bank 1

596,000	5.7752
938	2.9722
	2.8030

~~63~~

635 feet per month

2.8030
1.4150

1.3880

24.4 feet per day

26 days of five hour

Boots NY | Gas companies Mutual

29

1511

77

35 Mutual
77 New York
110

770
500
406
324
340
2340
496
64
7
2907

272
181
43
496

Shades

4
12
2
6
20
5
10
6
64

Well

80
4
12
25
20
25
30
8
40
70
10
324

50
200
20
60
4
6
340

89

2
8
2
4
3
6
12
2
4
43

Without Back

15
150
30
50
8
50
45
8
3
2
5
1
2
2
1
8
16
30
6
25
118
5
20
90
18
12
50
770

12
8
2
6
1
~~2~~
1
1
6
27
10
150
12
1
22
37
25
12
8
20
10
20
10
7
60
10
12
500

Fixtures Clear

4
2
1
2
7

6
10
3
5
8
12
30
105
20
10
9
10
20
3
12
40
6
10
9
9
4
8
12
20
25
406

g.g.

6
4
6
4
6
2
12
40
9
2
8
2
6
40
2
1
4
8
4
12
3
181

100
4
20
7
3
4
2
12
4
6
16
9
3
14
8
8
14
40
2
8
2
6
272

Book
Have noticed leakage

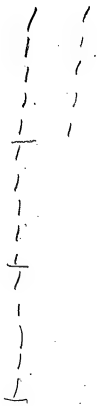
Yes Do not know No

1

99

5

Bark!
Use gas for heating



Bothered [Book!] with heat

Yes	Don't know	No
~~||||~~		~~||||~~
~~||||~~		~~||||~~
~~||||~~		10 ~~||||~~
~~||||~~ 20		20 ~~||||~~
~~||||~~		~~||||~~
~~||||~~ 30		~~||||~~
~~||||~~	38	30 ~~||||~~
~~||||~~ 40	67	|||
	105	
~~||||~~		
~~||||~~ 50		
~~||||~~		
~~||||~~ 60		
~~||||~~		
||		

Book 1
Dogpain jels

Yess

No

10 5 yes
2 no

 Stave to regulate

104

Boston 1

Like gas

Yes

No

$$\begin{array}{r} 85 \\ 25 \\ \hline 110 \end{array}$$

1/5	1/4
8	21

Ventilation Book 1

Fair	yes	Not Entered	No
		1	

Insurance Rank 1

1/2	3/4	1	1 1/4	1 1/2	Don't know	No
					11	
37	32	14	12	8	2	21

Yes	Fair	Not Ex Tran	No
40	70	1	20
50	75		
60			

23
75
7
106

beyond curb 5

1 11

middle street 200 vault

1

1

Book 1

Width sidewalk

Areaways? does vault extend towards

Even curb 10 feet 8 9

1 11

19

98

Day time

2	1	12
8	2	3
6	25	2
2	8	2
2	1	4
2	4	7
2	4	8
1	2	10
2	2	6
2	2	8
2	6	62
2	4	102
6	2	106
2	2	270
20	1	5
8	10	
22	4	
1	1	
3	1	
1	2	
2	3	
2	1	
5	1	
1	2	
	2	
	9	
106	102	

Book 1

Consumers Non Consumers

111

113

20

40

60

60

2

40

50

60

60

70

80

90

88

113

201

536 Books

$$\begin{array}{r} 536 \\ 10 \\ 205 \\ 100 \\ \hline 851 \end{array}$$

286
20
160

Lamp 100 Volts

10 Ohms Motor

90 contrary Volts
10 active Volts

$\frac{10}{10}$ 1 Weber

90 10
1
900 4400 ft. lbs.
44
396
440 100
4400 100
100)4400

Book 2

Book #

Bills for one year — $183.50

v.i.e. per month $15.29

Bills per month 58.15

17.00

Bills per week 4.05 230.90

Bills - Jan June 321.34

99.45	56.99	per month	47.10
60.40	32.83	per month	50.30
74.06	38.07		
233.91	127.89		418.74
127.89			
461.80			
230.90			

Book 2 →

659 burners

~~$321.34~~

2.25

~~2.5065~~
0.35??
2.1543

142000

65.9
26
5

2.4159
1.4150
.6990
4.9329

85700

5.1543
4.9329
.2214

1.6 hours per day

Book ~~#~~ 3

Jan.	Sun.	Mon.	Jean.
2.92	.25c	2.00	
17.25	8.10	12.00	
5.50	1.55	1.50	810
2.40	1.35	50.00	1225
6.75	68	2.25	2035
6.00	2.70	1.12	
4.50	.50	4.00	
4.50	.50	6.00	
3.25	.75	~~8.10~~	139.84
4.00	2.00	~~17.25~~	20.35
8.00	2.00	1.50	11949
9.00		2.00	
69.07	20.35	3.00	
		3.00	
		2.50	
		1.00	
		1.00	
		.62	
		1.50	
		3.50	
		4.50	
		8.00	
		1.50	
		139.49	

Book ~~RH~~ 3

Jan	July	Mon	Year
4.50	.45	2.00	
4.50	.10	1.00	
4.00	.30	3.00	
2.00	.38	2.00	
6.75	2.50	4.50	
7.00	.35	4.50	
4.75	.10	5.00	
33.50	4.18	1.00	
		2.25	
		2.75	
		2.75	
		2.75	
		2.75	
		2.75	
		275	
		275	
		275	
		275	
		275	
		275	
		275	
		275	
		275	
		275	
		275	
		69.75	

Book # 3

Jan	July	Mon	Year
4.00	2.00	100.00	
150.00	25.00	8.00	
2.00	.45	2.00	
4.00	1.35	.25	
14.00	1.20	15.00	
9.00	3.60	180.00	
7.00	.45	1.10	
16.50	1.60	1.25	
100.00	69.00	11.00	
		1.00	
306.50	104.65	4.00	
		1.50	
		2.50	
		1.00	
		15.00	
		2.00	
		20.00	
		2.00	
		15.00	
		21.00	
		7.50	
		5.00	
		416.10	

305
695
$ 1000

69594
20.35
$ 675.59
30534
98093

37 Jan Bills
36 July Bills.

Book ~~#~~ 3

Jan	July	Mon	Year	Totals	
6.00	2.25	15.00		69.07	20.35
3.00	.68	2.50		33.50	4.18
10.00	3.50	4.00		306.50	104.65
5.00	2.00	2.00		54.25	19.83
3.75	.90	1.50		462.32	$\boxed{149.01}$
7.00	2.00	2.00		149.01	
12.00	5.00	2.00		2 | 611.33	
1.50	.50	.75		305.66.	
6.00	3.00	1.50		For months of Jan + Dec.	
54.25	19.83	5.00			
		.50			
		25.00			
		8.00			
		1.00			
		4.50		119.49	
		70.25		69.75	
				416.10	
				70.25	
				$675.59	

Average in Jan $12.49
" " July $4.12

Total for month

Book 8

3	12	40	3
2	2	75	6
5	2	2	8
2	1	4	3
26	3	1	6
3	5	3	4
3	2	2	10
6	4	6	20
1	4	2	10
15	4	22	4
15	4	3	6
3	1	3	8
2	2	5	88
6	104	8	
3	5	6	
1	8	24	
1	1	12	
2	3	6	
4	5	2	
4	6	11	
7	3	20	
5	8	5	
8	8	5	
3	372	4	
3	16	5	
3	6	8	
6	7	9	
7	14	6	
150	4	6	
	616	2	
		5	
		311	

1165

maximum no. burners bet 5 & 6 P.M.

Book 3

1 – 1 Hoist	25 Horsepower	Grind Stone	Sewing Machine
1 – 1 "	10 " "	1	1
1 – 1 "	$1\frac{1}{2}$ " "		
1 – 1 "	one one	1	1
1 – 1 "	3/4 " "		
1 – 1 "	$37\frac{1}{4}$ H.P		
1 – 1 "			
1 – 1 "			
32 Hoists			

40 H.P

" " " " " " " " " " " " " "

Book 3

Do you use an engine, If so whose make is it.

Yes

Todd & McCafferty. 15 H. P.

Todd & McCafferty. 30 H. P.

Bryden.

25 H. P.

Copeland, 20 H. P.

1 caloric engine 2 H. P.

Smith Bros & Co

about 40

How much coal do you use per day, week or month for power.

3 Tons per week
10 " " month
6 " " "
3½ " " week =
2 " " " month
1 " " day
1 " " "
1 " " "

7
7
¼
2
3½
24
40
3
86¾ per week

Do you have a specially employed engineer or what proportion of the time does he spend on the engine.

Yes $\text{卌}\,2$

1/5 of time on engine

makes himself generally useful.

bridge tender attends to it

7 specially

Book 3

Do you rent power? If so how much do you pay per year for the whole or per Horse power?

Yes

1

84.00 per year

1

1

4 yes

No

~~HHH|||~~

190

How many H.P. do they charge you for

1 1/2 | 40

1

15

20

2

How much do you think you use

1/2 | 40

3/4

10

25

20

2

Book 3

Do you use the power all the time, If not what proportion.

Yes

卌, ||

all in cold weather.

Have you any machinery driven by foot power

Yes

1 sewing machine
1 grind stone
1 sewing machine
1 —

no

卌, 卌, 卌, 卌, 卌, 卌
卌, 卌, 卌, 卌, 卌, 卌,
卌, 卌, 卌, 卌, 卌, 卌 -
卌, 卌, 卌, |||.

109

Book 4.

Jan.	July:	Month.	Month	
13.00	6.00	3.00	5.00	3.50
3.00	.25	1.00	5.00	2.00
3.50	2.70	5.00	6.00	2.00
10.00	5.00	5.50	9.00	10.00
20.00	7.65	4.00	1.00	1.00
93.	30.	20.00	5.00	1.50
7.35	.68	10.00	5.00	3.00
11.00	1.00	1.00	.40	9.00
4.25	.45	4.50	3.00	1.00
3.00	.43	5.00	15.00	3.00
13.00	1.50	4.00	40.00	1.00
27.00	9.00	1.00	4.00	5.00
13.00	4.00	2.00	8.00	5.00
6.00	3.15	1.00	2.00	.75
5.00	3.50	2.00	10.00	5.00
5.00	1.00	5.00	15.00	20.00
5.00	2.00	1.00	3.00	5.00
3.00	.23	30.00	9.00	3.00
		40.00	2.00	4.50
		10.00	2.25	50.00
		5.00	15.00	4.00
		5.00	3.00	7.50
		40.00	8.00	20.00
		4.00	4.00	3.00
		3.50	1.00	1.00
		12.00	13.00	1.00
		2.00	18.00	
			6.00	
245.10	78.56	226.50	217.65	121.75
Jan.	July.			

Book 4

Jan July Month Year

Jan	July	Month
		1.50
12.00	8.78	2.50
3.00	1.46	50.00
		9.00
15.00	10.24	50.00
245.10	78.56	3.50
260.10	88.80	1.00
		.75
Jan	July	3.00
Total.	Total.	200.00
		13.00
		13.00
260.10 Jan		12.00
88.80 July		12.00
		4.00
2/348.90		5.00
174.45		380.25
		~~226.50~~
		217.65
		121.75
946.15		946.15
174.45		Total of Month average
1120.60		

Book 4

No of burners				
9	25	12	5	50
10	8	12	5	12
14	4	3	10	6
10	12	5	48	5
15	12	6	3	2
8	22	4	1	5
25	6	15	4	6
9	8	15	7	350
8	12	26	3	8
6	6	12	10	10
15	6	50	60	5
25	10	6	1	9
4	35	7	20	6
14	15	6	6	10
10	25	6	8	
4	2	15	6	
3	4	12	40	
4	15	3	3	
20	1	10	12	
9	8	2	3	
12	40	8	4	
6	10	9	7	
3	20	6	12	
30	6	10	18	
25	25	20	14	
8	6	6		
25	13	12		
25	33	12		
35				
40				
431	389	310	310	484

484
310
310
389
431
1824

Total burners.

Index

1). Extract of one house in Book 3.

			$\frac{x}{}$
Jan.	1291	cubic feetgas pr 1 burner =	16,7706 %
Feb.	651	" " =	8,7165 "
March	630	" " =	8,1839 "
Apr.	641	" " =	8,3269 "
May	603	" " =	7,8332 "
June	482	" " =	6,2613 "
July	323	" " =	4,1959 "
Aug.	196	" " =	2,5461 "
Sept.	357	" " =	4,6376 "
Oct.	605	" " =	7,8592 "
Nov.	555	" " =	7,2097 "
Dec.	1344	=	17,4591
S:	7698 = 100%	S:	100,0000%

$7698 : 1291 = 100 : x$ etc.

$x = 16{,}770\ \%$

x is the Model for the month. (in this house very good notices)

log. 16,7706 = 1,2245483
" 8,7165 = 0,9403446
" 8,1839 = 0,9129626
" 8,3269 = 0,9204801
" 7,8332 = 0,8939394
" 6,2613 = 0,7966691
" 4,1959 = 0,6228246
" 2,5461 = 0,4058782
" 4,6376 = 0,6662903
" 7,8592 = 0,8953775
" 7,2097 = 0,8579151
" 17,4591 = 1,2420214

The following numbers are quotients of the consumed gas divided by the number of burners (5–6^{h}). Comparatively few notices of consumed gas are used, but these, who appeared to be reasonables.

January.

214
308
1000
466
262
545
483
620
330
275
630
190
900
375
262

$$\frac{S^a\, 6598}{14} = 1\tilde{\ }, 2948\ \%$$

February.

214
233
592
262
275
533
390
155
876
580
457
550
200
215
~~560~~

S: 5532 = 10,3084 %

/14

March

214
192
133
266
607
33
350
165
1000
560
528
186
200
210

S: 4644 = 8,6537 %

14

April

214
166
425
133
290
180
183
200
443
33
37
290
145
466
235

S: 3155 = 5,8791 %

/14

May

214
191
520
583
133
100
83
416
100
83
66
429
480
33

S: 3431 = 6,3934 %
/14

June.

71
508
300
133
100
121
83
400
140
216
83
66
214
33

Sa 2468 = 4,5989 %

/7

July

71

220
408
475
250
311
133
100
165
83
516
140
120
83

S

Se 3075 = 5, 7300 %

1/4

[ITEM FOUND IN BOOK]

McGowan

Patent [illegible] system of Central station Conductors

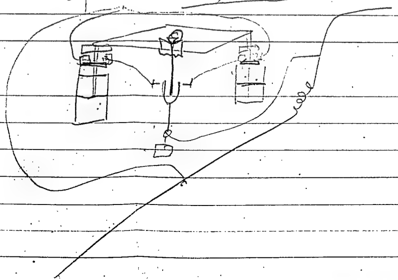
see abt = do

Chlorine Compounds in Lamp

anhydrous. part chlorides.

float Meter like 248 565-

Nitrated Cellulose paper punching out submitting to Vapor alcohol & Ether or other Solvent Either under pressure or not, Carbzg — fibres also



August

71
340
455
133
416
800
183
366
110
416
416
480
57
102

Sª 4345 = 8,0965 %
/14

September.

71
161
125
400
400
104
158
232
251
667
33
83
390
136

$8\ 3212 - 5,9853\ \%$

$/14$

October

214
566
300
161
165
566
566
350
100
100
350
566
566
165

These numbers are the last 5 numbers above, for there were but very few notices, concerning the month of October.

$\mathcal{L}$ 4735 – 8,8232 %

/17

November.

214
266
800
161
195
733
760
171
100
471
471
100
171
760

the same thing, like in the months of October.

$£ \frac{5373}{12} = 10,0121 \cdot \frac{9}{2}$

December

214
743
583
800
466
404
416
433
560
460
366
366
686
600

ß 7097 = 13,2246 %

/14

Summary:

Jan:	6598 =	lg: 1,0897212 =	12,2948 %	
Feb:	5532 =	" 1,0131911 =	10,3084 "	
Ma:	4644 =	" 0,9372011 =	8,6537 "	
Apr:	3155 =	" 0,7693083 =	5,8791 "	
May	3431 =	" 0,8057296 =	6,3954	+
June	2468 =	" 0,6626541 =	4,5989	
July	3075 =	" 0,7581540 =	5,7300	
Aug:	4345 =	" 0,9082987 =	8,0965	
Sept.	3212 =	" 0,7770844 =	5,9853 "	
Oct.	4735 =	" 0,9456289 =	8,8232	
Nov:	5373 =	" 1,0005257 =	10,0121	
Dec:	7097 =	" 1,1213837 =	13,2246	
S^a	53665 = 100 %		S^a = 100,0000 %	

$53665 : 14$

$53665 : 6598 = 100 : x$

$x = 12,2948\%$

The division by 14 (the number of posts) is not executed, ~~while~~ not necessary.

Extract of an other house in Book 3,
January was not notified and therefore
I have taken the number of December
for this month.

Jan:	1065 =	lg 1,0913891 =	12,3421 %
Febr:	837 =	0,9867650 =	9,6999 " ±
March	726 =	0,9249761 =	8,4135 "
April	640 =	0,8702195 =	7,4168 "
May	509 =	0,7707573 =	5,8987 "
June	497 =	0,7603959 =	5,7596 "
July	485 =	0,7497812 =	5,6206 "
Aug	506 =	0,7681900 =	5,8640 "
Sept	634 =	0,8661288 =	7,3473 "
Oct	771 =	0,9510939 =	8,9350 "
Nov	804 =	1,0153770 =	10,3604 "
Decb:	1065 =	1,0913891 =	12,3421 "
S =	8629 = 100 %		S = 100,0000 %

$8629 : 1065 = 100 : x$

$x =$

Recapitulation of Per Cents:

Month	House of Boats 3, very clear.	Dito, but the month of Jan. was not entered.	Average of 14 Notices.	Average:
Jan	16,7706	12,2948	12,3421	13,8025
Feb.	8,7165	10,3084	9,6999	9,5749
Mar	8,1839	8,6537	8,4135	8,4170
Apr	8,3269	5,8791	7,4168	7,2076
May	7,8332	6,3934	5,8987	6,7084
June	6,2613	4,5989	5,7596	5,5399
July	4,1959	5,7300	5,6206	5,1822
Aug	2,5461	8,0965	5,8640	5,5022
Sept	4,6376	5,9853	7,3473	5,9901
Oct	7,8592	8,8232	8,9350	8,5392
Nov	7,2097	10,0121	10,3604	9,1941
Dec	17,4591	13,2246	12,3421	14,3419
	100,0000	100,0000	100,0000	100,0000

The Per Cents of the column "Average" will be the "modul" for the calculation of consume of gas per house, if but few monthes are notified.

Logarithmens of the „modulus

13,8025 January = 1,1399578
9,5749 February = 0,9811342
8,4170 March = 0,9251573
7,2076 April = 0,8577907
6,7084 May = 0,8266190
5,5399 June = 0,7435019
5,1822 July = 0,7145142
5,5022 August = 0,7405364
5,9901 Sept. = 0,7774341
8,5392 Oct. = 0,9314172
9,1941 Nov. = 0,9635092
14,3419 Decbr = 1,1566067

The „modulus" of any month is used, as follows:

There shall be calculated the amount of consumed gas per year by the only notice of the month of July, = 250 cubicfeet.

The „modulus" for July: 5,1822 %

$$5{,}1822 : 100 = 250 : x$$

$$x = 4824{,}2 \text{ cubicfeet a year.}$$

The Percents rot:

Jan:	14 %	Transf	52 %
Febr:	10 "	July	5 "
March	8 "	Aug.	5 "
Apr:	7 "	Sept	6 "
May	7 "	Oct.	9 "
June	6 "	Nov.	9 "
		Decb.	14 "
Transf.	52 %	S.a	100 %

How I found the key for the calculation of the average consume of gas per year.

1.) I divided several hunderts of notices, month by month, by the number of burners and entered these units on a table, containing the months, eliminating unreasonable numbers.

2.) In this manner calculating several books, I found in book 3 a house, where every month seemed to be entered very reasonable and correct, (not only) by the clerc himself, but of course of good informations received!

In the same book I found an other house, entered in the same

manner, but the month of January was missing. I supposed this month would have the amount of the month of December and supplied him in this manner.

3.) How I was able, to make the 3 calculations on page 131, 133 – 157 and 159.

The Recapitulation is to be seen on page 161 and the last column of this table contains the average amount of percents, which belong to every month, whole the year = 100 %

4. Page 163 shows, how the percents are arrounded and now it is very easy, to calculate whatever an average amount of consumed gas per year by only one month's notice. Viz:

Notice of February 1000 cub.f.

$$10\% : 100\% = 1000 : x$$

$$x = 10000 \text{ cubfeet}$$

Menlo Park, Hermann Claudius
24. Decbr. 1880.

Mutual Gas C^o per 1000 cubfeet 2 \$ 25 c.
New-York " " " " " 2 " 25 "

5 Cab- f... p. Hause = 15 ...

1 ...

1 Streetlamp a 4000 hours per year.) calcul: with 12 h.

2)

Street	Nr.	per Year Cub: Feet	Cub f p. Day	Burners	p. burner and day
Spruce Street	2.4.6	14000	.	6	
	8	162000		70	
	10	132000		30	
	12.14	159000		8	
	16	60000		4	
	18	252000		60	
	20	24000		50	
	22	11000		2	
Corner Spruce and William		16000		1	
		830000	2274	231	(9)
William Street	179	64000		6	
	177	32000		6	
	175	7000		1	
	173	13000		3	
	171	7000		2	
cor. William and Beekman		21000		3	
Book 10		144000	394	21	18
Beekman Street	36	19000		2	
	34	16000		2	
	32	40000		8	
	30	117000		47	
	28	118000		33	
	24	466000		64	
	20	293000		31	
	18	11000		5	
	16	19000		6	
	14	37000		4	
	12	27000		2	
	10	32000		6	
corner Beekman and Nassau		~~27000~~		1	
do.		138000		2	
		1333000	3652	211	17

Street	Nr.	per Year Cub: Feet	cub feet p. Day	Burners	p. burner and day
Nassau Street	138	4000		1	
	140	27000		4	
	142	117000		5	
	144	16000		6	
	146	37000		8	
	148.152	1.177000		63	
Book 10		1372000	3759	87	43
Spruce Street		~~7000~~		~~2~~	
	26	11000		2	
	28.30	11000		4	
	32	19000		14	
	34	64000		20	
	36	37000		8	
	38	10000		4	
	40	17000		5	
Spruce an. Gold St.		19000		4	
Book 12, Book 20		188000	516	61	8
Gold street	67	32000		4	
Corner of Nch. G. St.		133000		20	
		165000	453	24	19
Beekman Street	56	16000		4	
	54	95000		15	
	52	10000		3	
	46	53000		2	
	44	53000		12	
Cor. Nassau and William		1067000	3545	58	
		1294000	~~453~~	94	

Str.	No.	Block	Per Year Cubic feet	Cub feet per day	Burner	per burner and day
[illegible]	172	Block 20	13000		3	
	174		27000		2	
	176		28000		7	
	178		54000		6	
	180		16000		3	
			136000	372	21	18
Corner Ferry & Gold			58000		6	
Ferry st.	6	Block 25	8000		2	
	8		11000		2	
	12		5000		1	
	26-28		19000		4	
	30		4000		1	
	38		21000		4	
			126000	345	20	17
Cliff st.	67		16000		6	
	65		13000		4	
	2		58000		12	
			87000	238	22	11
Beekmanstr.	88/90		267000		36	
	86		11000		2	
	82/84		279000		112	
	80		46000		8	
	76		80000		8	
	74		400000		88	
	72		58000		16	
	70		134000		12	
	68		48000		12	
	66		42000		12	
Corner Beek. and Gold			37000		7	
			1396000	3824	313	12

Str.	No.	Block	Per Year Cubicfeet	Cubfeet per day	Burner	per burner and day
Gold str.	72	Block 27	27000		2	
	74		2000			
	80		13000		3	
	~~82~~		42000	115	3	
Corner Cliff & Ferry str.			27000			
			27000	74		
Ferry st.	50	Block 28	2000		1	
			2000	5	1	
Corn. Ferry and Pearl str.			120000		15	
			120000	329	15	22
Pearl str.	307		36000		5	
	305		21000			
	301		71000		12	
	299		11000		2	
	293		20000		4	
	291		41000		8	
Cor. 289 Pearl and Beekm.			222000		20	
			422000	1156	51	22
Beekman st.	96		40000		8	
	94		48000		8	
	92		85000		12	
Corner Beekm. and Cliff			27000			
			200000	548	28	
Cliff st.	66	Block 26	4000		1	
	68		13000			
	70		69000		9	
			86000	235	10	

Str.	No.	Block	Per year Cubicfeet	Cub f. p. Day	Burners	p. burner and day
Dock Slip	10		6000			
			6000	16		
Cor. Dock slip and Water			9000		5	
			9000	22	5	4
Water str.	256		27000		7	
	254		8000		4	
	252		3000		1	
	248		10000		3	
	246		11000		4	
	244		12000		4	
	242		3000		8	
	240		5000		7	
	238		5000		6	
	236		59000		24	
	234/32		54000		35	
Corner Beekm. Waterstr.			78000		20	
			275000	753	123	6
Beekmanstr.	110-116		42000		10	
	106/8		2000			
			44000	121		
Corner Beekm. and Pearlstr.			48000		9	
Pearlstreet	292		10000		6	
	294		43000		13	
	296		65000		28	
	302		73000		12	
	304		64000		4	
			Tr.: 255000			
			9000			
			Total			

Spoke with Mr. Clarke and rejected because not [illegible] burning

Str.	No.	Block	Per Year Cubicfeet	Cub feet per day	per Burner	per burner and day
Pearlstreet	308	Block 35	20000		3	
	310		38000		10	
	300		54000		14	
			367000	1005	99	10
C. Waterstr. and Dockslip			16000		6	
Dock slip	22	Block 43	27000		8	
			43000	122	14	8
Cor. Frontstr. and Dockslip			5000		2	
			5000	14	2	7
Frontstreet	228/30		113000		6	
	232/34		3000		2	
	226		8000		6	
	224		11000		4	
	222		3000		3	
	220		44000		7	
	218		5000		3	
	216		4000		1	
	214		11000		2	
Cor. Beekm. and Frontstr.			34000		14	
			236000	646	48	13
Beekmanstr.	126		4000		2	
	124		21000		4	
Cor. Beekm. and Waterstreet			80000		15	
			105000	288	21	14
Waterstreet	233		13000		3	
	235		1000		1	
	237		16000		6	
			Tr. 30000		10	

1 Str	2 Nr	3 Per Year Cubic feet	4 Cubic feet per day	5 Summe	6 Summe per day
Waterstreet, Block 43	239/41	60000		10	
	245/47	42000		2	
	249	5000		3	
		137000	348	23	
Corn: Front St. and Peckslip, Block 43		14000		4	
		14000	38	4	9
Peckslip	40	37000		5	
Corn: Peckslip and South str, Block 51		233000		12	
		270000	739	17	43
South str	116	21000		8	
	114/115	16000		4	
	113	53000		6	
	112	32000		5	
	111	64000		8	
	110	48000		7	
	109	58000		8	
	108	80000		8	
Corn: South and Beekman	105	260000		10	
		202000		17	
		1244000	3408	81	42
Commission Beekman str		27000		8	
		27000		8	

1 Str	2 Nr	3 Per Year Cubic feet	4 Cubic feet per day	5 Summe	6 Summe per day
Front street, Block 51	225	20000		8	
	229/31	58000		7	
		105000	287	23	12
Corn: South, Fulton and Beekm.		87000		12	
		87000	238	12	19
Corn: Beekm. str Fulton Market		104000		24	
		~~57000~~		~~5~~	
		104000	285	24	12
Beekm: Front str. Fulton market		59000		11	
		~~48000~~		~~4~~	
		59000	162	11	15
Corn: Fult. Mc. Front str.		152000		24	
		~~93000~~		~~13~~	
		152000	403	24	17
Block 50, Boat 2: Corn: Fulton str. Fult. Mc.		246000		35	
		246000	674	35	19
Corn: Fult. South Fult. Mc.		194000		10	
		~~187000~~		~~7~~	
		194000	531	10	53
Corn: South str. Fult. Mc.		374000		37	
		~~48000~~		~~6~~	
		374000	1024	37	
Fulton Mc.	88/89	240000		26	
		240000	657	26	25
Outside stand South str. Fult. Mc.		61000		13	
		61000	167	13	13

Str	Nr	Per Year Cubic feet	Cubic feet per Day	Summe	Summe per Day
Outside stand Fulton and South str. Fulton Mc.		21000		6	
		21000	57	6	9
Outside stand Fulton Mc. Fulton str.		32000		1	
		32000	87	1	87
Beekm: Str.		16000		15	
		16000	44	15	3
Front str.		32000		4	
		32000	88	4	22
Front str. and Fulton str. Fulton Market, Block 50		22000		14	
		22000	60	14	4
Fulton Market	241	29000		3	
	212	13000		1	
	214/216	8000		2	
	220	20000		6	
	236	2000		3	
	233	25000		1	
	231	25000		1	
	222	11000		2	
	224/226	20000		3	
	194/195	37000		4	
		208000		26	
		216000		30	

Str	No	Per Year Cubic feet	Cubic feet per Day	Summe	Summe per Day
		21		30	
Fulton Market	163/65	30000		7	
	111, 112, 113, 120, 121, 122, 123	48000		5	
	125, 126, 127	85000		8	
	152/53	16000		2	
	165/67	8000		3	
	161/62	14000		3	
	132/60	11000		3	
	98/00	19000		6	
	95/97	21000		7	
	117/18	16000		2	
	146/48	4000			
Block 50	172	16000		2	
	176	11000		1	
	150/51	22000		3	
	177/78	3000		5	
	182/83	14000		2	
	184/5	24000		4	
	202/03	24000		4	
	198/201	22000		4	
	188/89	5000		1	
	196/97	24000		2	
Corn: Fulton and South street		264000		51	
Opposit: Fult. Mc.		431000		56	
Foot of Fult. St. East Riv.		825000		104	
Corn: Beekm.		5000		5	
		2185000	5959	346	19
Beekman str, Block 42, Boat 3	123	48000		8	
		48000			

1	2	3	4	5	6
Beekmanstreet	119	48000 / 11000		8 / 3	
Corner Beekm. & Waterstr.	127 / 74	13000		6	
		72000	197	17	11
Waterstreet	217	1000		3	
	213/215	80000		8	
	211	71000		8	
205/209 Water, 21 Fulton, 202/4 Frontstreet		960000		372	
		1112000	3046	391	8
Corner Water & Fultonstr.		31000		16	
Fultonstr.	23	12000		6	
	19	20000		18	
	17	83000		40	
		152000	416	80	5
Corner Front & Fultonstr.		88000		75	
Frontstr. Block 42	203	5000		2	
	205	21000		4	
		114000	311	81	4

1	2	3	4	5	6
Corner Water & Beekmanstr.		8000		3	
Beekmanstr. Block 34	117	13000		6	
	115	5000		2	
Corner 109 Beekm. & 242 Pearlstr.		183000		22	
Beekmanstr.	105	13000		3	
Corner Beekm. & Pearlstr.		150000		3	
		302000	827	39	21
Pearlstreet	280	11000		5	
	278	8000		8	
	274	34000		6	
	272	656000		24	
Corner Fulton & Pearlstr.		111000		12	
		895000	6130	55	111
Fultonstreet	35	54000		6	
	33/34	30000		1	
	31	125000		30	
	29	437000		5	
	27	12000		8	
	(77000)				
Corner Fulton & Waterstr.		25000		9	
		353000	967	59	16
		77000			
		276000			

1	2	3	4	5	6
Waterstreet Block 34	206	8000		5	
	203	20000		5	
Corner Beekm. & Water					
		28000	77	10	8
Beekmanstr. Block 27	101	8000		3	
	99	16000		4	
	97	23000		6	
Corner Beekm. & Cliffstr.		77000		14	
		124000	339	27	12
Cliff Str.	52	5000		4	
	50	9000			
	48	134000		20	
	46	7000		10	
	44	3000		4	
	42	30000		6	
Fulton Corner Cliffstreet		42000		17	
		230000	630	61	10
Fultonstr.	51	7000		12	
	49	27000		14	
	47	93000		10	
	45	29000		15	
	43	2000		8	
Corner Fulton & Pearlstr.		123000		25	
		282000		84	

1	2	3	4	5	6
Fultonstreet	41	232000 / 78000		85 / 14	
		360000	986	98	10
Corner Fulton & Pearlstr.		48000		21	
Pearlstr.	269	97000		43	
	271	27000		10	
	273	44000		41	
	275	11000		19	
	277	54000		12	
	279	27000		6	
Corner Cliff & Beekmanstr.		308000	844	15	5
		5000		3	
Block 27 Pearlstr.	283	71000		30	
		71000	194	30	6
Corner Cliff & Beekmanstr.		160000		25	
		160000	438	25	17
Pearlstr. Block 27	281	250000		2	
		250000	685	2	
Beekmanstr. Block 24	85	82000		24	
	83	28000		12	
	81	87000		22	
	79	27000		6	
	77	84000		20	
		608000		84	

1	2	3	4	5	6
		608000		84	
Beekmanstr.	75	38000		12	
	73	27000		10	
	71	290000		35	
	67/69	25000		15	
Corn. Gold and Jackson		60000		27	
		1048000	2871	183	15
Goldstr.	64/62	57000		20	
	60	21000		8	
	56/58	85000		40	
Corn. Gold and Fultonstr.		214000		40	
		377000	1033	108	9
Fultonstr. Block 4	77	17000		10	
	73	62000		33	
Corn. Fulton and Goldstreet		334000		165	
Fultonstr. Block	~~73~~	~~20000~~		~~43~~	
	69	75000		33	
	67	16000		12	
	65	42000		12	
	63	48000		17	
	61	181000		30	
	59	92000		42	
	57	97000		50	
		~~554000~~		~~176~~	
		984000	2641	404	6

1	2	3	4	5	6
Corn. Fulton Cliff str.		80000		44	
Clifford Str. Block 24	45	5000		2	
	47	8000		6	
	49	16000		15	
	51	29000	378	12	5
Corn. Beekman and Jackson		55000	4	183	
Beekmanstr. Block 19	59	47000		19	
	57	58000		16	
	55	56000		38	
	53	112000		17	
	51	92000		63	
	47	17000		7	
	45	24000		10	
Corne Beekman and William str.		352000		80	
		811000	2222	263	8
Williamsstreet	164	157000		43	
	162	51000		38	
	160	300000		18	
	158	126000		34	
Corn. William and Ann str.		267000		50	
		901000	2468	183	13
Annstreet Block 19	79				

1	2	3	4	5	6
Corn. Ann ... Goldstreet					
Goldstreet	59	19000		6	
		19000	52	6	9
Corn. Gold and Annstr.		5000	52	5	4
Corn. Gold and William ... Ann Block 18		4000		3	
		9000		8	
Annstreet	86	30000		11	
	74/84	1067000		350	
		1376000	3769	369	10
Corn. Ann and Williamstr.		87000		8	
Williamstr.	152	155000		15	
	150	103000		15	
	148	32000		10	
	146/48	68000		35	
Corn. William and Fultonstr.		45000	1219	83	14
		90000		16	
Fultonstr.	99	14000		7	
Corne William and Fultonstr.		10000		5	
		14000		23	

1	2	3	4	5	6
		118000		58	
Fultonstreet	97	73000		28	
	87	48000		36	
	85	21000		8	
	83	7000		3	
		263000	721	103	7
Corner Gold and Fultonstreet Block 18		44000		24	
Goldstreet	55	25000		1	
		69000	189	25	7
Corne Beekman and Williamstr.		46000		42	
Beekmanstr. Block 9	33	64000		18	
	31	423000		55	
	29	51000		20	
	27	38000		24	
	25	96000		35	
	23	70000		20	
	21	133000		20	
	19	26000		22	
	15/17	274000		50	
	13	41000		12	
Corner Beekman ...		47000		25	
		1329000	3641	343	11

1	2	3	4	5	6
Nassaustr. Block 9	132	5000		6	
	130	13000		8	
Corn. Beekm. and Nassaustr.		3000		1	
Nassaustr.	128	32000		10	
	124/26	37000		20	
	122	209000		11	
	120	43000		16	
	118	88000		15	
	116	39000		20	
	114	89000		18	
	110/12	5000		6	
	108	9000		4	
Cor. Nassaustr. Annstreet		65000		31	
		637000	1745	166	11
Annstr.	37	11000		4	
	39	11000		4	
	41	120000		18	
	43	7000		4	
	45	8000		12	
	47	29000		24	
	49	35000		32	
	51	12000		12	
	53	66000		22	
	55	15000		6	
	57	52000		30	
		375000		168	

1	2	3	4	5	6
		375000		168	
Annstreet	59	107000		47	
Nassau 57/59 Annstreet		58000		18	
Annstreet	61	5000		6	
Corn. Annstr. Williamstr.		123000		30	
		668000	1830	269	6
Williamstr. Block 8	161	113000		24	
	163	30000		18	
	165	10000		6	
	167	139000		17	
	169	5000		4	
Corner William and Annstreet		44000		50	
		341000	934	119	8
Annstreet Block 6	60	116000		18	
		116000	317	18	17
Corner Annstr. and Fultonstr. 115	54½	200000		25	
		200000	548	25	22
Corner Annstr. and Fultonstr. 117		233000		18	
		33000	90	28	5
54 Annstr. and 111–113 Fultonstr.		229000		50	
		229000	627	50	12

1	2	3	4	5	6
Annstreet	50	40000		27	
	48	18000		3	
	46	13000		8	
		71000	194	38	5
Ann and 42 Fult. Street		121000		26	
		121000	331	26	12
Annstr.	42	5000		4	
		42000		8	
		47000	129	12	11
Cor. Nassaustr. Annstr.		173000		32	
		173000	473	32	15
Nassaustr. Block 5	102	40000		5	
Cor. Ann and Nassaustr.		97000		82	
Nassaustr.	100	124000		30	
	98	40000		21	
Cor. Nassau and Fultonstr.		601000		108	
		902000	2471	246	10
Fultonstr.	125	254000		50	
	123	128000		41	
	121	5000		1	
		387000		95	

1	2	3	4	5	6
Fultonstr. Block 8	119	48000		12	
	117	91000		37	
	109	107000		35	
	107	69000			
	105	70000		47	
Cor. William and Fultonstr.		370000		142	
		1148000	3145	8	8
Williamstr.	149	29000		16	
		29000	79	16	5
Cor. Fulton and Nassaustr.		64000		14	
Fultonstr. Block 6	124	91000		34	
	122	516000		62	
	120	146000		41	
	118	28000		40	
	116	289000		94	
	114	292000		100	
Cor. Fulton and Dutchstr.		69000		30	
		1451000	3975	415	9
Dutchstr.	d. total	1886000			
	17	22000		4	
	15	44000		6	
	9/11/13	142000		15	
		21000		16	
Cor. Dutch and Johnstr.		151000		44	
		380000	1041	85	12
Johnstr.	47	74000		16	
	45	9000		8	
		83000			

1	2	3	4	5	6
		83000		7	
Johnst.	43	58000			
	41	114000		46	
	39	32000		14	
	37	40000		16	
	35	50000		10	
	33	19000		17	
Cor. Nassau and Johnstreet		74000		27	
		466000	1276	144	9
Nassaust. Block 6	74	11000		8	
	76	19000		13	
	78	46000		25	
	80	84000		36	
117000	82	117000		42	
	84	99000		24	
(82 and 84 mixed)	82	1000		2	
	82/84	28000		8	
	86	111000		34	
	88	55000	1564	116 24	7
Cor. Nassau & Fultonstr.		140000		16	
Fultonstr. Block [illegible]	110	27000		6	
	106/108	286000		150	
	104	167000		70	
	102	39000		34	
	100	83000		30	
Cor. William & Fultonstr.		21000		8	
		618000	1693	293	6

1	2	3	4	5	6
Fultonstr. Williamstreet Block 17	139	86000		20	
	135/137	46000		25	
	133	23000		10	
	131	133000		86	
	127/129	45000		20	
	123	4000		4	
	119/121	167000		40	
	115/117	179000		45	
Cor. Fulton & Williamstr.		683000 / 83000	1871	230 / 30	9
John str. Block [illegible]	57	133000		60	
Cor. John & Dutchstr.		159000		48	
		292000	830	108	7
Dutchstr. Block 7	12	61000		15	
	10	12000	200	16	6
Cor. William & Fultonstr.		14000		23	
Fultonstr. Block 17	98	120000		15	
	96	22000		10	
	94	58000		36	
	92	140000		30	
	90	141000		38	
	88	4000		8	
	86	3000			
	82	24000		9	
	78	24000		11	
		519000	1422	157	9

1	2	3	4	5	6
Cor. Fulton and Goldstr.		18000		10	
Goldstreet	47	50000		23	
	45	46000		18	
	43	7000		10	
	41	4000		4	
	33	53000		18	
	29/31	9000		9	
Cor. Gold and Johnstreet		37000		30	
		224000	6148	122	50
Johnstr.	83	57000		10	
	79	114000		47	
	77	143000		50	
	75	15000		8	
	71	127000		35	
Cor. John and Williamstr.		33000		20	
		489000	1339	170	8
Williamst. Block [illegible]	114	9000		10	
	116	50000		9	
	118	10000		8	
	120	31000		22	
	126	37000		10	
	128	10000		2	
	130	30000		6	
	134/136	357000		75	
	138	38000		7	
		570000	1561	149	10
Fultonst. Block 23	74/76	7000		7	
		7000		7	

1	2	3	4	5	6
Cor. Gold and		7000		7	
Fultonstr.		18000		16	
Fultonstreet	76	54000		7	
	74	27000		8	
	74/76	11000		8	
	70/76	144000		50	
Cor. Fulton and Ryders Alley		168000		65	
		439000	1202	161	7
Fultonstr. Block [illegible]	66/68	41000		18	
	64	54000		28	
	62	50000		24	
	60	35000		7	
	58	51000		21	
	58/60	57000		22	
Cor. Cliff and Fultonstr.		157000		58	
		445000	1219	158	7
Cliffstr. Block 8	27	87000		22	
	25	129000		24	
	23	25000		8	
	21	108000		57	
	19	93000		50	
	17	123000		36	
	11/13	100000		26	
	7/9	122000		30	
		787000	2156	253	8

	1	2	3	4	5	6
Corn. Johnst. and Cliff. St.			77000		26 -	
Johnst.		97	3000 ~~42000~~		4 -	
		95	20000		10 -	
		93	15000		10 -	
		91	7000		6 -	
Total			122000	441	56	8
Gold st. Block 25		30	6000		5 -	
		38	20000		12 -	
		40/42	78000		12 -	
		44	33000		5 -	
		46	7000		4 -	
Corn. Cliff st. and Fulton st.			11000		7 -	
			155000	424	45	9
Fulton st. Block 26		50	20000		10 -	
		48	27000		13 -	
		46	13000		15 -	
		44	22000		12 -	
		42	21000		12 -	
		40	91000		28 -	
Corn. Fulton and Pearl st.			14000		5	
Fulton st.			22000		4	
			350000	959	99	9

	1	2	3	4	5	6
Pearlstreet		261	11000		6 -	
		257	27000		18 -	
		255	11000		6 -	
		251	130000		20 -	
		249	5000		9 -	
		247/49	104000		2 -	
		245	32000		14 -	
Corn. Pearl and Johnstreet			64000		15 -	
			384000	1052	90	11
Johnst.		113	11000		8 -	
		107	2000		1 -	
		105	12000		4 -	
Corn. Cliff and Johnst.			86000		19	
			111000	308	32	9
Cliff st. Block 26		14	4000		7	
		16	5000		4	
		18	36000		12	
		20	42000		8	
		22	29000		7	
		24	18000		8	
		26	36000		8	
		28	13000		6	
		32	30000		7	
		34	19000	635		9
Corn. Fulton and Pearl st.			288000		20	
Block 33					20	

	1	2	3	4	5	6
			81000		20	
Fulton street Block 33		38	9000		5	
		36	11000		9	
Corn. Fulton and Waterstreet			51000		18	
			159000	435	52	8
Waterstreet		198	556000		60	
		194	33000		3	
		186/190	100000		20 -	
		184	4000		2	
		~~182~~	693000	1899	85	22
Burling Slip		5	3000		1	
		3	23000		4	
			26000	71	5	14
Pearl st. Block 33		242	44000		8	
		244	25000		13	
		246	16000		5	
		252	6000		2	
		254	179000		39	
		258/60	417000		48	
		262	92000	2137	12	16
Corn. Water and Fulton st.			12000		9	
			22000		9	
Block 41						

	1	2	3	4	5	6
			92000		9	
Fultonstr.		26	36000		14 -	
		24	13000		6	
		22	11000		6	
		20	121000		33	
			203000	556	68	8
Frontstreet Block 41		196	7000		5	
		194	25000		10	
		190	3000		~~10~~ 2	
		186	29000		15	
		184	4000		3	
Corn. Front and Burling Slip			25000		7	
			93000	254	42	6
Burling Slip		17	11000		7	
Corn. 181 Water and Burling Slip			4000		3	
			15000	41	10	4
Waterstreet Block 41		185/187	5000		8	
		189/191	9000		12	
		197	7000	57	3	2
Corn. Fulton and Frontstreet			100000		36	
Fultonstr.		116	9000		4	
			109000		20	

1	2	3	4	5	6
		103400		20	
Southstreet	14	11000		11	
	12	46000		10	
	10	157000		55	
	8	9000		9	
	(204/206)	264000		81	
	2	16000		6	
Corner Fulton and Southstr.		118000		50	
		730000	2000	242	8
Southstr.	92	40000		16	
	91	67000		16	
	90	11000		5	
	89	47000		18	
Corner Southstr. and Burling Slip		34000		18	
		199000	545	73	7
Burling Slip	31/35	50000		12	
	29	6000		6	
Corner Front and Burling Slip		9000		6	
		65000	178	24	7
Frontstreet Block 49	189/91	10000		16	
		10000	27	16	2
Corner Southstr. and Burling Slip		36000		16	
Burling Slip Block 48	38	7000		2	
	34	3000		2	
	32	46000		12	
		92000		32	

1	2	3	4	5	6
		92000		32	
Burling Slip	26	4000		1	
		96000	263	33	8
Frontstr. Block 48	171	4000		1	
	167	3000		1	
	165	4000		4	
	163	7000		6	
Corner Frontstr. and Fletcherstr.		67000		15	
		85000	233	27	8
Maiden Lane Block 47	157	4000		6	
	159	4000		2	
	161	4000		2	
	163	6000		6	
Corner Maiden Lane and South-Str.		114000		10	
		132000	362	26	14
Corner 78 Southstr. and Fletcherstr.		14000		10	
Southstreet Block 48	80	7000		3	
	83	45000		11	
	85	58000		3	
	86	54000		12	
Corner Burling Slip and Front Str.		178000	488	59/74	12
		3000			
		3000	81	4	2
Corner Burling Slip and Waterstr.		22000		11	
Block 40		22000		11	

1	2	3	4	5	6
		22000		11	
Waterstreet	177	11000		6	
	175	4000		3	
	173	5000		4	
	169	3000		1	
	167	7000		4	
	165	4000		3	
Corner 161/163 Waterstr. and Fletcherstr.		14000		25	
		70000	192	57	3
Fletcherstreet Block 40	20	4000		4	
	22	11000		2	
Corner Fletcherstr. and Frontstr.		21000		12	
		36000	98	18	5
Frontstr.	164	9000		6	
	166	4000		3	
	168	4000		2	
	176	3000		2	
	178	11000		8	
Corner Fletcherstr. and Frontstr.		9000		4	
		40000	109	25	4
Waterstreet	157	5000		3	
	155	11000		3	
		000			
Corner Waterstr. and Maiden Lane		36000		12	
Block 39		52000	142	18	8

1	2	3	4	5	6
Maiden Lane Block 39	137	21000		6	
Corner Front and Maiden Lane		13000		5	
Corner Waterstr. and Frontstr.		34000	93	11	8
Corner Burling Slip [illegible]		4000		3	
Burling Slip Block 32	4	4000		7	
Corner Burling Slip and Pearlstreet.		67000	195	6	
		75000	194	17/16	15 12
Pearlstreet	230	7000		3	
	228	2000		15	
	226	6000		4	
	222	43000		32	
	220	5000		2	
	218	26000		13	
	216	20000		6	
	214	271000		20	
Corner Pearl and Fletcherstreet		19000		9	
		399000	1093	90	12
Fletcherstreet	4	11000		5	
		11000	30	5	6
Waterstreet	160	5000		4	
		5000			

1	2	3	4	5	6
Waterstreet Block 32 Ward 10	164	4000		2-	
	166	7000		5-	
	168	4000		2-	
	170	4000		2-	
	172	4000		2-	
	174	7000		8-	
	178	7000		5-	
	178½	4000	126	2-	4
Corn. Fletcher and Pearlstreet		27000		5-	
Corn. Pearl and Maidenlane		7000		4-	
		34000	93	9	10
Maidenlane Block 31 Ward 11	115	3000		2-	
	119	4000		4-	
	123	25000		10-	
	125	14000		10-	
	129	14000		5-	
Corn. Maidenlane and Waterstr.		33000		13-	
		93300	255	44	6
Corn. Waterstr. and Fletcherstr.		5000		5-	
		5000	14	5	3
Johnstreet Block 22 Ward 11	116	4000		1-	
	114	11000		2-	
	112	2000		2-	
	108	50000		5-	
	104 & 106	33000		5-	
	104	52000		25-	
		152000		40	

1	2	3	4	5	6
Johnstreet Block 22 Ward 11	102	11000		8-	
Corn. Johnstr. and Pearlstr.		44000		10-	
	98	33000		6-	
Corn. of John and 19 Plattstr.		28000		5-	
	94	51000		4-	
	92	50000		22-	
Corn. Johnstr. and Goldstr.		6000		4-	
		375000	1027	99	10
Corn. Gold and Plattstr.		64000		25-	
		64000	175	25	7
Plattstr.	21	125000		59-	
	13	31000		4-	
	3	9000		4	
	1	10000		9-	
Corn. Plattstr. and Pearlstr.		13000		8-	
		188000	515	84	6

1	2	3	4	5	6
Pearlstreet Block 22 Ward 11	227	21000		5-	
	229	4000		2-	
	231	11000		4-	
Corn. Platt and Pearlstr.		3000		4-	
		13000	107	9	
		48000	121	26	6
Corn. 14/16 Platt and 119 Pearlstr.		9000		5	
		18000		8	
Plattstr. Ward 11 Block [illegible]	8/10	3000		10-	
	12	7000		3-	
	14	18000	318	5-	12
Goldstreet	7, 8, 10	41000		35-	
	8	18000		4-	
	6	6000		2-	
	4	3000		1-	
Corn. Goldstr. and Maidenlane		21000		8-	
		45000	125	50	25
~~Goldstr.~~	~~6~~	~~6000~~		~~2-~~	
	~~4~~	~~3000~~		~~1-~~	
Corn. Goldstr. and Maidenlane		~~21000~~		~~8-~~	
Maidenlane	91	3000		1-	
		3000		1	

1	2	3	4	5	6
Maidenlane	93	48000		27-	
	95	25000		3-	
	97	24000		13-	
	99	16000		13	
	101	14000		6	
	103	11000		8	
	105	25000		14-	
Corn. Pearlstreet and Maidenlane		24000		7	
		190000	521	92	5
Pearlstreet Ward 11 Block 21	203	41000		15-	
	205	4000		2-	
	207	22000		7-	
	209	45000		31-	
	213	4000		2	
	215	30000		7-	
	217	24000	466	12-	6
Corn. [illegible] and Pearlstr.		23000		6	
Johnstr. Block No [illegible]	88	34000		22-	
	86	28000		14-	
	84	104000		25-	
	82	21000		5-	
	80	13000		5-	
	78	52000		10-	
	76	116000		36	
	74	19000		6-	
	72	40000		24	
		450000	1233	153	8

1	2	3	4	5	6
Cor. John and Williamstr.		61000		20	
Williamstr. Block 32	104	89000		9	
	102	17000		4	
	100	29000		12	
	98	48000		26	
		244000	668	71	9
Goldstreet Block 16	21	4000		2	
		4000	55	2	26
Cor. Gold and Plattstreet		74000		13	
		74000	202	13	16
Plattstr. Block 15	28	9000		6	
	30	6000		3	
	32	7000		3	
	38	18000		6	
Cor. William and Plattstr.		64000		45	
		104000	285	63	4
Williamstr.	90	26000		12	
	88	62000		35	
	86	19000		9	
Cor. Maiden and Williamstr.		27000		12	
		134000	367	68	5

1	2	3	4	5	6
Maidenlane Block 15	67	11000		3	
	71	4000		3	
	73	50000		12	
	75	28000		10	
	81	31000		16	
	83	7000		5	
	85	4000		3	
Cor. Maiden and Goldstreet		3000		2	
		138000	378	54	7
Goldstreet Block 15	9	36000		14	
	11	25000		6	
	13	4000		4	
Cor. William and Johnstr.		140000	178	32	7
Johnstreet Block 5	66	9000		5	
	64	78000		13	
Cor. John and Williamstreet		61000		37	
Johnstr.	62	71000		34	
	60	114000		40	
	58	136000		40	
	56	137000		25	
	54	11000		5	
	50	83000		24	
	48	21000		10	
		[illegible]		265	

1	2	3	4	5	6
		861000		205	
Johnstreet	42	117000		14	
	36	16000		6	
	34	33000		8	
Cor. Nassau and Johnstr.		42000		13	
Johnstreet Block 5	32	70000		22	
		1139000	3120	327	9
Nassaustreet	68	52000		9	
	66	75000		29	
	64	87000		28	
	62	136000		18	
Cor. Maiden and Nassaustr.		244000		63	
		564000	1545	139	11
Maidenlane	31	200000		36	
	33	102000		24	
	35	157000		49	
	37	166000		37	
	39	138000		47	
	41	118000		38	
	43	101000		32	
	45	92000		43	
	47	56000		7	
	49	84000		34	
		1294000		347	

1	2	3	4	5	6
		1294000		347	
Maidenlane Block 5	51	177000		59	
	53	4000		2	
	55	59000		16	
	57	114000		23	
	59	83000		15	
	61/63	92000		34	
	65	144000		28	
Cor. Maiden and Williamstr.		77000		23	
		2044000	5600	547	10
Williamstr. Block 5	87	10000		6	
	91	17000		14	
	93	22000		6	
	97	31000		14	
	99/101	139000		40	
	103/105	44000	421	18	7
Cor. Maiden and Nassaustr.		72000		[illegible]	
Maidenlane	30	157000		26	
	32	152000		49	
	36	85000		29	
	38	64000		14	
	40	47000		12	
	42	33000		10	
	44	48000		18	
	44½	32000		5	
	46	73000		24	
	48	139000		34	
	50	51000		15	
		953000		256	

1	2	3	4	5	6
		3000		256	
52	52	40000		12 ✓	
Maidenlane Block 4	54	110000		36 ✓	
	56	37000		8 ✓	
	58	20000		6 ✓	
	60	33000		8 ✓	
Corner Maidenlane and Williamstr.		107000		25	
		300000	356	51	10
Corner Liberty and Williamstr.		199000		43 ✓	
Libertystreet	23	50000		10 ✓	
	31	10000		4	
	39	83000		7 ✓	
	41	13000		2 ✓	
	43	83000		22 ✓	
	47/49	122000		20 ✓	
	51	69000		15 ✓	
Corner Nassaustr. and Libertystr.		21000		9 ✓	
		451000	1235	89	14
Nassaustr. Block 4	44/46	52000		7 ✓	
	44	10000		5 ✓	
	46	10000		5 ✓	
	42	12000		15 ✓	
	48	8000		2 ✓	
	50	34000		12 ✓	
		186000	509	46	11
Maidenlane Corner Williamstr. and Libertystr.		86000		32 ✓	
Block 14		86000	235	32	7

1	2	3	4	5	6
Corner 66 Maidenlane and Williamstr.		9000		3 ✓	
		9000	24	3	8
68 Maidenlane Corner 11 Libertystr.		13000		3	
		13000	36	3	12
Corner 70 Maidenlane 9 Libertystr.		36000		8	
		36000	98	8	12
Corner 74 Maidenlane and 5 Libertystr.		47000		8	
		47000	129	8	16
Maidenlane Block 14	74½	6000		2 ✓	
	74	78000		31 ✓	
Corner Maidenlane and Libertystr.		78000		14 ✓	
		162000	444	47	9
Corner Nassau and Libertystr.		22000		4 ✓	
Corner 38/40 Liberty 61 Cedar 30 Nassau		222000		38 ✓	
		244000	668	42	16
Libertystr. Block 3	36	17000		2	
	34	6000		2	
	30	89000		22	
	24	212000		42	
	20	72000		25	
Liberty and Williamstr.		27000		10	
		424000	1161	108	11
Williamstr.	75	38000		6 ✓	
		~~38000~~		6	
		[illegible]			

1	2	3	4	5	6
		18000		6	
Williamstr. Block 3	73	172000		28 ✓	
	71	18000		3 ✓	
	67	2000		1	
	67/69	10000		3	
Corner 67 Williamstr. Cedarstreet		18000		5 ✓	
Corner 41 Cedarstreet and Williamstr.		11000		6 ✓	
		269000	737	52	14
Cedarstr.	45	79000		12 ✓	
	47	67000		4	
	49	11000		2	
	51	58000		41	
	55	119000		13 ✓	
	57	133000		20	
	59	69000		20 ✓	
	61	112000		16 ✓	
Corner 28 Nassau and Cedarstr.		11000		1 ✓	
		659000	1805	124	14
Nassaustr. Block 3	30	22000		7 ✓	
	32	11000		4	
	36	22000		6	
	38	41000		13	
		96000	263	30	9

1	2	3	4	5	6
Corner Liberty and Williamstr. 78		11000		5 ✓	
Williamstr. Block 13	78	22000		10 ✓	
Libertystr.	2	22000		8 ✓	
		55000	151	23	6
Maidenlane	86	44000		12	
	88	219000		53	
	90/94	89000		20	
	96	32000		11 ✓	
	98	87000		72	
	100	12000		2 ✓	
	102	52000		5	
Corner 108 Maidenlane and Pearlstr.		130000		20 ✓	
		562000	1594	12	3
Pearlstr.	193	9000		2 ✓	
Corner Pearl and Cedarstreet		17000		10 ✓	
		26000	71	12	6
Cedarstr.	3	30000		3 ✓	
		30000		3	

1	2	3	4	5	6
		30000			
Cedar str.:	5	9000		3	
	7	39000		12	
	13	56000		7	
	15	11000		2	
	17	56000		12	
	23	13000		5	
Corner William and Cedar str.:		690000		48	
		904000	2476	92	27
William str.: Block 13	68/70	52000		28	
	72	69000		6	
	74	59000		25	
	76	87000		4	
		266000	729	63	11
Corner 114 Maiden Lane Pearl Street		28000		?	
Maiden Lane Block 30	130	28000		20	
		56000	153	20	8.
Water Street	146	6000		2	
	144	11000		5	
	140	60000		7	
	136	111000		20	
	134	48000		11	
Corner Pine str.		236000	646	45	14
Pearl street	172	10000		4	
	178	11000		4	
	180	22000		8	
		43000		16	

1	2	3	4	5	6
Pearl str. Block 20	182/186	28000		16	
	188	85000		22	
	190	79000		3	
	192	64000		12	
		229000	627	69	9
Maiden Lane	140	6000		3	
		6000	16	3	5
Front str.: Block 38	154	6000		3	
	152	8000		6	
	146	17000		7	
	144	7000		2	
146 Corner of Depeyster str. N. West Corner		13000		4	
		51000	139	22	6
141 Front str. Corner of Depeyster str.		6000		2	
		6000	16	2	8
Front str.:	145	17000		4	
	151	7000		4	
		24000	66	8	8
137/139 Water str. Corner of Depeyster and Pine str.		145000		32	
		145000	397	32	12
133 Water str. Corner Pine str. S.E. corner		78000		12	
		78000	214	12	18
157 Front str. Corner of M. Lane S.E. corner		20000		6	
Maiden Lane	164	3000		2	
	166	44000		6	
168 M. Lane Corner South str.		33000		6	
		80000	219	20	11

1	2	3	4	5	6
75 South str. Corner of Maiden		6000		3	
South str.	73/74	7000		2	
71/72 South str. Corner Depeyster str.		17000		5	
		30000	82	10	8
Depeyster str.	31	67000		5	
		67000	183	5	36
139 Front str. Corner of Depeyster str. N.E. Corner		44000		8	
Front str.	141	22000		3	
	143	12000		2	
		78000	214	13	16
137 Front str. Corner of Depeyster str. S.E. Corner		6000		2	
34/36 Depeyster str. Corner South str. 76 South str.		6000		2	
		12000	33	4	8
69 South str. Corner Pine str. North C.		89000		3(?)	
		89000	244	3	81
Pine str.:	90	47000		10	
		47000	129	10	13
133 Front str. Corner Pine str.		11000		3	
Front str.	135	15000		6	
		26000	71	9	8

Continuation page 200

3)

Remarks:

Column

1 = Street.

2 = Number of the house

3 = Consume of Gas per Year in Cubicfeet average.

4. = Consume of Gas per Day average ($\frac{\text{Cub. feet}}{365}$)

5 = Number of burners.

6. = Consume of Gas by every burner per Day ($\frac{\text{Column 4}}{\text{Column 5}}$).

4) Remark: The numbers, written with pencil, are doubtful.

Block	Cub: Feet Consumed Gas per Year	Numb: of Burners	$\frac{\text{Cub: Feet}}{\text{Burners}} = x$; $\frac{x}{365} = y$
			x y
10	3679000	550	
20	1783000	200	
25	1651000	358	4612 : 365 = 13
28	857000	100	
35	701000	237	
43	540000	112	
51	1706000	133	12827 : 365 = 35
50	~~3728000~~ 3741000	~~536~~ 538 and $\frac{4}{2}$	6955 : 365 = 19
42	1450000	569	2548 : 365 = 7
34	~~1578000~~ [illegible]	163	9810 : 365 = 27
27	1343000	368	
24	2687000	799	3363 : 365 = 9
19	1731000	452	3829 : 365 = 10
18	2153000	580	3712 : 365 = 10
9	2975000	897	3316 : 365 = 9
8	3752000	±849	
6	2868000	860	
7	983000	431	2281 : 365 = 6
17	1802000	598	3013 : 365 = 8
23	1987000	693	2672 : 365 = 7
26	1077000	203	
33	1658000	269	6163 : 365 = 17
41	332000	143	2322 : 365 = 6
49	1004000	355	2828 : 365 = 8
Transf.	44038000	107?? $\frac{4}{2}$	

Vir. Block 22 u. 21 page 187.

Block	Cub: Feet Consumed Gas per Year	Numb: of Burners	$\frac{\text{Cub: Feet}}{\text{Burners}} = x$; $\frac{x}{365} = y$
	44038000	1075 $\frac{4}{2}$	
			x y
47	132000	26	5077 : 365 = 14
48	362000	103	3514 : 365 = 10
40	146000	100	1460 : 365 = 4
39	86000	29	2966 : 365 = 8
32	531000	143	3713 : 365 = 10
31	132000	58	2276 : 365 = 6
22	666000	223	2986 : 365 = 8
21	944000	249	
16	698000	226	3088 : 365 = 8
15	515000	222	2320 : 365 = 6
5	4010000	1111	3609 : 365 = 10
4	1937000	486	3986 : 365 = 11
14	353000	101	3495 : 365 = 10
3	1692000	361	4687 : 365 = 12
13	1833000	315	
	~~5206200~~	~~1450 $\frac{4}{2}$~~	~~: 365 = 11~~
30	521000	134	
38	57000	25	2280 : 365 = 6
37	145000	32	4531 : 365 = 11
36	1161000	182	6379 : 365 = 19
46	285000	58	4914 : 365 = 13
45	174000	6	
44	1020000	239	4268 : 365 = 11
	61438000	1520? $\frac{4}{2}$	(4039 : 365 = 11,1)

Block	Cubic Feet of Consumed Gas per Year	Number of burners	$\frac{\text{Cub: Feet}}{\text{Burners}} = x;\ \frac{x}{365} = y$
	61438000	15294½	4089 : 365 = 11,1
1			" : 300 = 13,5
2			
11			
12			
29			
cf. page 171 Block 35 +	9000		
	61447000		
÷	77000		
cf. page 174 Block 34	61370000		
+ cf. pg. 179	256000		
	61626000		
÷ cf. pg. 182:	39000		
	61587000		
+ cf. pg. 179	167000		
	61754000		
	61754000	15204½	4061 : 365 = 11,1
Block 36 Contin:			" " : 300 = 13,5
	252000	57	
29	1170000	237	
12	227000	82	
	63879000	15264	4060 : 365 = 11,1
cf. pg. 194 Block		5	360 = 13,5
Block 11	~~2371000~~	~~698~~	
" 1	4194000	1319	
	35000		
" 2	3676000	355	
" 1	3543000	448	
Final	75730000 actual gas	17971½	

5.) Index.

Book	Blocks	Block	Book	Block	Book
1	10, 20, 25	1		29	18
2	28, 35, 43, 51, 50	2		30	15
3	42, 34, 27,	3	14	31	11
4	24, 19, 18, 27	4	13	32	10
5	9	5	12	33	9
6	8, 6,	6	6	34	3
7	7, 8 contin: 17	7	7	35	2
8	23	8	6 & 7	36	16 & 17 & 18
9	26, 33, 41, 49	9	5	37	16
10	48, 47, 40, 39, 32 41	10	1	38	16
11	31, 22, 21	11	19 and 20.	39	10
12	16, 15, 5	12	18 and 19.	40	10
13	4	13	15	41	9
14	14, 3,	14	14	42	3
15	13, 30	15	12	43	2
16	38, 37, 36, 44, 45	16	12	44	16.
17	~~46~~, 36. 45 Part 44	17	7	45	16
18	12. 29.	18	4	46	~~17~~ 16
19.	end of 12. 11.	19	4	47	10
20.	11. (end)	20	1	48	10
21.	2.	21	11	49	9-10
22.	1.	22	11	50	2
		23	8	51	2
		24	4		
		25	1		
		26	9		
		27	3		
		28	2		

Fulton Market
Book 3

Continuation of page 193.

1	2	3	4	5	6
Pine and Front South corner 6 Section	111 Block 36	7000		3	
Pinestr.	97	16000		5	
	95	4000		2	
131 Frontstr. Corner of Pinestr. S.E. corner		40000		10	
		67000	183	20	9
Frontstr.	129	22000		6	
	125/127	208000		20	
	121/123	116000		39	
	119	50000		8	
	117	18000		6	
		41 4000	1134	79	14
Wallstr.	106	27000		12	
	108	51000		15	
	110	38000		7	
	112	14000		6	
	114	93000		24	
	116	33000		8	
	118	54000		8	
60 Southstr. corner Wallstr.		49000		7	
		359000	983	87	11
Southstr. Block 40	61	28000		7	
	62	22000		10	
	65/66	19000		10	
	66	19000		10	
	67	92000		16	
		180000	493	53	9
Frontstr. Block 36	132	44000		11	
87 Pinestr. and 132 Frontstr.		10000		9	
		54000	148	18	8
133 Waterstr. Corner Pinestr.	Block 36	7000		2	
Waterstr.	133	7000		2	
	131	60000		15	
	127/129	100000		28	
	127	22000		8	
	123/125	495000		14	
	121	83000		16	
90 Wallstr. corner Waterstr. E. corner		50000		8	
		824000	2257	93	24
Wallstr.	90	10000		5	
	92	15000		3	
	94	14000		8	
(60000)	96	60000		13	
	98	14000		6	
	100	9000		3	
	102/104	31000		9	
Corner Frontstr. and Wallstr.		44000		8	
Wallstr. Block 36	104	8000		4	
		205000	561	59	9
Frontstreet Block 36	120	70000		21	
	122	5000		8	
	124	43000		9	
	126	11000		3	
	128	11000		4	
	130	36000		12	
		282000		57	

1	2	3	4	5	6
~~Corner 130 Waterstr. Pinestr.~~		—		—	—
Waterstreet	130/132	~~46000~~		~~11~~	
Pinestreet Block 29	83	11000		3	
	81	1000		3	
	79½/166	75000		14(?)	
	79	33000		8	
		120000		28	
Pearlstr.	168	4000		2	
	166	18000		5	
	164	274000		14	
	162	39000		14	
	160	7000		7	
	158	11000		6	
		353000		48	
Wallstreet Block 48	80	16000		3(?)	
	78	164000		22	
	82	106000		24	
	88	9000		3	
	84	71000		22	
	86	103000		26	
	84/86	22000		11	
		491000		111	
Waterstreet	130/132	46000		11	
	118	21000		7	
	120	87000		17	
	122	4000		1	
	124	18000		5	
	126	11000		3	
	128	19000		6	
		206000		50	
Pearlstreet Block 12	181	27000		12	
		27000		12	
Cedarstreet	2	4000		4	
	10	14000		8	
	12	13000		6	
	16	11000		4	
	18	9000		2	
	20	20000		12	
	24	14000		5	
	28	32000		8	
	36/38	32000		9	
		149000		56	
Williamstreet	62	28000		8	
	60	23000		6	
		51000		14	

Continuation in book 19.

1	2	3	4	5	6
Williamstreet	60			13	
	58	76000		71	
	56	33000		2	
Corner William and Pinestreet		18000		5	
		127000		91	
Pinestreet Block 12	48	111000		16	
	50/52	244000		2	
	54	113000		31	
	56	43000		12	
	58	19000		13	
	62	27000		11	
	64	2		6	
	66	45000		32	
		602000		12L	

1	2	3	4	5	6
		602000		421	
Pinestreet	66½	21000		16	
	68	8000		2	
	70	21000		8	
	70½	31000		10	
	72	15000		5	
	74	8000		2	
	76	8000		2	
		714000		169	
171 Pearl, Corner of Pinestreet	Merk 12				
Pearlstreet	173	4000		1	
	175	2000		2	
	177	32000		1	
	~~179~~	38000		4	

Block 11.

1	2	3	4	5	6
S.W. Corner of Pearl & Pinestr. and No 77 Pinestreet		239000		125	
Pinestreet	73	29000		12	
	67	38000		4	
	65	13000		6	
	63	55000		25	
	59/61	30000		6	
	55/57	42000		18	
	55			4	
		446000		200	
52–54 William Street, Corner Pinestreet				28	

1	2	3	4	5	6
Williamstreet	52/54	525000		122	
	52	32000		10	
	52/54	18000		12	
	~~48~~	~~656000~~		~~127~~	
Merk 11		575000		172	
Wallstreet	48	656000		127	
	50	694000		139	
	4	23000		18	
	52	316000		119	
	54	340000		84	
	56	153000		77	
	58	39000		15	
	60	43000		8	
	62	175000		45	
	64	49000		19	
	66	127000		41	
	68	164000		37	
	70	67000		27	
	72	15000		20	
	74	36000		69	
		2897000		845 ~~1393~~	
Pearlstreet	157/159	100000		12	
	161	160000		80	
	165	51000		10	
		311000		102	

Block 2.

1	2	3	4	5	6
63 Williamstr. Corner Pinestr.		96000		22	
Williamstreet	61	98000		16	
	61/63	29000		3	
	59/59	112000		13	
	59	3000		1	
46 Corner Pinestr. & Williamstr.		123000		4	
		461000		59	
Pinestreet	44	3000		1	
	42/41	57000		4	
	42	61000		10	
	40	104000		8	
	38	60000		7	
	36	103000		13	
	34½	45000		5	
	34	169000 / 5000		6 / 1	
	~~34½~~	~~11000~~		~~2~~	
	32	51000		4	
	30	39000		6	
	28	18000		1	
	26	48000		2	
	24	69000		6	
	22	72000		14	
Merk 11		904000		90	
Nassaustreet	14	124000		7	
	16/18	128000		4	
	20	190000		7	
		1442000			

1	2	3	4	5	6
		1442000			
Nassaustreet	22	99000		4	
	24	61000		3	
	26	168000		10	
		1770000		100	
Cedarstreet	62	109000		12	
	62/64	57000		9	
	64	79000		7	
	60	18000		25	
	58	8000		2	
	56	56000		14	
	52	19000		6	
	48	8000		3	
	46	14000		3	
	44	32000		6	
	42	141000		19	
		541000		106	
N.E. Corner Pinestr. 51 Williamstr.		47000		4	
Pinestreet	51/53	50000 / 84000		8 / 8	
	39	55000		7	
	35	39000		2	
	"	42000		4	
	"	26000		4	
	31/33	341000		37	
	37	36000		5	
	29	27000		4	
	27	139000		11	
	25	187000		5	
	23	700000		228	
Merk 1		1773000		327	

1	2	3	4	5	6	1	2	3	4	5	6
Wallstreet	34	492000		17							
	36	99000		5							
	38	170000		15							
	40	347000		41							
	42	350000		8							
	44	134000		29							
	46	178000		6							
		1770000		121							

1	2	3	4	5	6	1	2	3	4	5	6

6.) 1 Kerosenelamp = 1/2 Gaslamp = 6 houres daily = 6 Cubicfeet of Gas average

Block	Street	Number of Kero. lamps	Would be consume of Gas average per Year in Cubicfeet	Cubicfeet pr. day	Horse power	City (Street) Lamps: Street	Number of Lamps	Gas per Year Cubicfeet
10.	Spruce Str.	—	. . . .		27	Beekmanstreet	15	131400
	William str.	—	. . . .		....	Fultonstreet	18	157680
	Beekman str.	—	. . . .		50	Goldstreet	9	78840
	Nassau str.	—	. . . .		120	Cliffordstreet	6	52560
		—			197	Williamstreet	14	122640
20.	Spruce str.	—	. . . .		16	Pinestreet	3	26280
	Gold str.	—	. . . .		....	Nassaustreet	6	52560
	Beekm. str.	—	. . . .		10	Annstreet	5	43800
	William str.	—	. . . .		3	Dutchstreet	2	17520
					27	Ryders Alley	2	17520
25.	Ferry str.	—	. . . .		11	Johnstreet	12	105120
	Cliff str.	—	. . . .		3	Pearlstreet	13	113880
	Beekm. str.	.	. . . .		224	Burling Slip	13	113880
	Gold str.	.	. . . .		3	Fletcherstreet	5	43800
					248	Frontstreet	7	61320
28.	Ferry str.	.	. . . .		12	Southstreet	7	61320
	Pearl str.	.	. . . .		12	Waterstreet	6	52560
	Beekm. str.	.	. . . .		....	Plattstreet	7	61320
	Cliff str.	.	. . . .		....	Maiden Lane	26	227760
					24	Libertystreet	11	96360
35.	Peck slip	.	. . . .		2	Cedarstreet	4	35040
	Water str.	.	. . . .		4	Depeysterstreet	3	26280
	Beekm. str.	.	. . . .		11	Wallstreet	5	43800
	Pearl str.	.	. . . .		....			
					17		199	1743240
43.	Peck slip	.	. . . .		....	Frontstreet	1	8760
	Front str.	.	. . . .		23	Waterstreet	2	17520
	Beekm. str.	.	. . . .		....	Wallstreet	2	17520
	Water str.	.	. . . .		....	Pearlstreet	1	8760
					23	Cedarstreet	4	35040
51.	Peck slip	.	. . . .		..		209	1830840
	South str.	.	. . . .		....			
	Front str.	.	. . . .		15			
					15			
50	Fulton Market	16			85			
		16	35000	96	80			
		16		96	626			

Block	Street	Number of Kero. lamps	Would be consume of Gas average per Year in Cubicfeet	Cubicfeet pr. day	Horse power
		16	35000	96	626
42	Beekm. str.	2			2
	Water str.	..	. . . . .	. . .	45
	Fulton str.	.	. . . . .	. . .	. . .
	Front str.	8			15
		10	21000	60	62
34	Beekm. str.	4			35
	Pearl str.	8			. . .
	Fulton str.	6			. . .
	Water str.	4			. . .
		22	48000	132	35
27.	Beekm. str.	19			2½
	Clifford str.	9			40
	Pearl str.	7			42½
	Fulton str.	24			. . . .
		59	130000	355	85
24	Beekm. str.	11			172
	Gold str.	.	. . . . .	. . .	105
	Fulton str.	39			69½
	Cor. Fulton & Cliff	20			. . . .
		70	153000	420	346½
19	Nassau str.	31			35
	William str.	5			16
	Ann str.	4			50
		40	88000	240	101
18.	Ann str.	23			44½
	William str.	3			10
	Fulton str.	22			8
	Gold str.	31			. . .
		79	173000	474	62[illegible]
9.	Nassau str.	4			30
	Nassau str.	59			5
	Ann str.	135			105½
	William str.	57			12½
		255	558000	1530	153
		[illegible]	1207000	330[illegible]	1390½

Block	Street	Number of Kerosene Burners	Would be Consumed of Gas average per Year in Cubic feet	Cubic feet per day	Horse-power
		557	1207000	3307	1390½
8	Ann st.	19			22½
	Nassau st.	18			12½
	Fulton st.	29			82½
	William st.	18			28
		84	184000	504	145½
6.	Fulton st.	21			24
	Dutch st.	53			10
	John st.	20			3
	Nassau st.	116			
		210	460000	1260	37
7	Fulton st.	9			109
	John st.	4			35½
	Dutch st.	..			3
		13	28000	78	147½
17.	Fulton st.	106			24
	Gold st.	77			108½
	John st.	15			24
	William st.	68			22½
		266	583000	1596	179
23.	Fulton st.	60			11
	Cliff st.	9			12
	John st.	4			—
	Gold st.	26			108
		99	217000	597	131
26	Fulton st.	48			—
	Pearl st.	41			2
	John st.	33			½
	Cliff st.	26			—
		148	324000	888	2½
33.	Fulton st.	4			—
	Water st.	12			50
	Burling Slip	1			—
	Pearl st.	12			6.
		29	64000	174	50
		1400	3067000	8401	2142

Block	Street	Number of Kerosene Burners	Would be Consumed of Gas average per Year in Cubic feet	Cubic feet per day	Horse-power
		1400	3067000	8401	2142
41	Fulton st.	13			—
	Front st.	8			4
	Burling Slip	1			—
	Water st.	15			—
		37	81000	222	4
49	Fulton st.	24			
	South st.	...			
	Burling Slip	2			8
	Front st.	3			—
		29	64000	174	13
48.	Burling Slip	33			—
	Front st.	12			—
	Fletcher st.	7			—
	South st.	20			—
		72	158000	432	—
47.	Front st.	21			—
	Maiden Lane	35			—
		56	123000	336	—
40.	Burling Slip	36			—
	Water st.	5			6
	Fletcher st.	—			—
	Front st.	11			—
		52	114000	312	6
39.	Water st.	2			—
	Maiden Lane	62			—
		64	140000	384	—
32.	Burling Slip	17			—
	Pearl st.	12			—
	Fletcher st.	2			—
	Water st.	14			—
		45	99000	270	—
31	Pearl st.	17			—
	Maiden Lane	17			—
	Water st.	7			—
		41	90000	246	—
		1796	3936000	10777	2163

Block	Street	Number of Burners	Would be Consume of Gas average per Year in Cubic feet	Cubic feet per day	Horse power
		1795	3936000	10777	2163
22	Johnstr:	119			9
	Plattstr:	26			14
	Pearlstr:	8			–
		153	335000	918	23
~~21~~	~~Frankfortstr:~~	~~15~~			–
	~~Pearlstr:~~	~~12~~			–
	~~Fletcherstr:~~	~~2~~			–
	~~Waterstr:~~	~~14~~			–
~~24~~	~~Pearlstr:~~	~~15~~			–
	~~Maiden Lane~~	~~15~~			–
	~~Waterstr:~~	~~8~~			–
21	Plattstr:	5			–
	Goldstr:	9			25
	Maidenlane	31			–
	Pearlstr:	21			–
		66	145000	396	25
16	Johnstr:	25			29
	Williamstr:	15			–
	Goldstr:	10			12
		50	110000	300	43
15	Plattstr:	40			10
	Williamstr:	18			23
	Maidenlane	25			7
	Goldstr:	8			–
		91	199000	546	40
5	Johnstr:	93			121½
	Nassaustr:	50			–
	Maidenlane	58			44
	Williamstr:	20			20½
		221	484000	1326	186
4	Maidenlane	78			12
	Libertystr:	41			–
	Nassaustr:	20	304000		–
		139		834	12
		5716	5513000	15097	[illegible]

Block	Street	Number of Burners	Would be Consume of Gas average per Year in Cubic feet	Cubic feet per Day	Horse power
		2316		15097	2534
14	Maiden Lane	4	5513000		–
	Libertystr:	12			–
		16	35000	96	–
3	Libertystr:	84			25
	William str:	27			–
	Cedarstr:	71			27
	Nassaustr:	21			–
		203	445000	1218	52
13	William str:	33			–
	Maiden Lane	40			15
	Pearlstr:	18			–
	Cedarstr:	50			60
		141	309000	846	45
50 [?]	Maiden Lane	63			–
	Waterstr:	45			6
	Pinestr:	9			–
	Pearlstr:	35			90
		154	337000	924	96
65 [?]	Maiden Lane	13			–
	Frontstr:	31			–
	Depeysterstr:	8			–
		52	114000	312	–
44	Frontstr:	33			–
	Maidenlane	49			–
	Southstr:	12			–
	Depeysterstr:	12			–
		106	232000	636	6
37	Burlingslip [?]	13			–
	Frontstr:	10			–
	Pinestr:	7			–
		30	66000	181	6
30	Frontstr:	25			33
	Waterstr:	7			–
	Wallstr:	27	129000		–
		59		354	33
		3277	7180000	19662	2786

Block	Street	Number of Kerosene Burners	Would be Consume of Gas average per Year in Cubic feet	Cubic feet per day	Horse power	
		3277	7180000	19663	2786	
45.	Depeyster str:	11			—	
	Southstr:	6			—	
	Pinestr:	2			—	
	Frontstr:	4			—	
		23	50000	138	—	
46	Pinestr:	7			—	
	Frontstr:	13			24	
	Wallstr:	53			—	
	Southstr:	41			3	
		114	250000	684	27	
		3414	7480000	20485	2793	

(The sum 7480000 is found by multiplying the amount of the days with 365 and then arranged, therefore appears not 20493, but 20485).

2893

Block	Street	Number of Kerosene Burners	Would be Consume of Gas average per Year in Cubic feet	Cubic feet per day	Horse power	
Continued 36	Frontstr:	18			—	
		18	39000	108	—	
29	Waterstr:	23			—	
	Pinestr:	18			—	
	Pearlstr:	19			—	
	Wallstr:	16			—	
		76	166000	456	—	
12	Pearlstr:	24			—	
	Cedarstr:	64			—	
	Williamstr:	18	232000		—	
		106		636	—	
		3614	7917000			
12	Corner Williamstr Pinestr				3	2 Elev: Waterpower
					245 (x 10)	18 Hoistways run by hand
11.	Corner Pearl and Pinestr:				50	Pinestreet: 1 Elev: probably steam; 4 Hoistways run by hand.
	Corner William and Pinestr:				10	
					2966	

Block	Street	Number of Kerosene Burners	Would be Consume of Gas average per Year in Cubic feet	Cubic feet per day	Horse power	
11	Wallstreet				18	2 Elev: steam, 1 probably steam
	"				28	3 Elev: probably steam. 2 do Water. 1 Hoistway by hand.
"	Pearlstreet					

7-1

Results of the before indicated Calculations of the books 1 – ~~17~~ 18 (~~3~~ 3 blocks yet not received).

Consume of Gas per Year in the houses: ~~61 425000~~ 63.403000 Cub: F.

" (3614 × 6 × 2½ × 365) reduced from the Kerosenelamps: 19.787000 " "

~~7 480000~~ " "

(209 × 5 × 12 × 365) by streetlamps: ~~2 2 440000~~ 4 577000

~~(199 Lamps × 2 Cubic feet per hour × 12 hours × 365 days)~~ ~~4 358000~~ ~~1 743000~~ " "

Per Year 87 767000 C.F.

~~Per Year~~ ~~76 648000~~ C.F.

Per day 193556 C.F.

~~241000~~ ~~240000~~ C.F.

Number of Gasburners in the houses: ~~15100 & 4/2~~ 15580

" " " on the Streets: ~~199~~ 209

" " " reduced of the Kerosenelamps (~~3414~~), 2 K.L. = 1 Gasburner: ~~1707~~ 1807

$\left(\frac{3614}{2}\right)$

S^a 17596 & 4/2 S^a ~~17100 & 4/2~~

17598 = ~~17108~~ 17408 Lamps of large size.

1 Horsepower = 6 Lamps of large size:

$\frac{17408}{6} = 2851\frac{5}{6} = 2851$ Horsepowers

Steamengines of 5 H.P. and below = 566 "

Total 3417 Horsepowers.

Per Horsepower Cubicfeet of Gas daily:

$\frac{\cancel{193556}\ 241000}{2851} = \cancel{68}\ 84$ Cub: Feet of gas per Horsepower; that means, 1 H.P. is sufficient, to drive all lamps, which would light as long and as much, as do gasburners, the average lighting time being 2,25 hours.

6 electric lamps = 1 Horsepower, therefore 11,3 Cub: F. = 1 electric lamp, the same quotient, already obtained page 195 (4039 : 365 = 11,1).

1 Gasburner = 5 Cubicfeet:

$\frac{11,1}{5} = 2,25 = 37$ cub. f. per hour equal to 1 Horsepower!

That is almost the theoretical effect.

Menlo Park 28. January 1881.

Hermann Claudius.

8.

Steamengines of 5 Horsepowers and below book 1 - 17:

½ H.P. ~~11~~ 12 = ~~5½~~ 6 H.P.
1 " " 57 = 57 " "
1½ " " 14 = 21 " "
2 " " 51 = 102 " "
2½ " " 10 = 25 " "
3 " " 42 = 126 " "
3½ " " 2 = 7 " "
4 " " 40 = 160 " "
4½ " " 5 = 22½ " "
5 " " 8 = 40
~~240~~ 241 566½ H.P.

Remark concerning the following tables:
There is entered but the number of burners, written by "numbers", not by "words"; in the books. The "words" are but generally given notices and can be counted ~~as to~~ as "the highest number of burners", but not to other "periods."

Number of Burners from 8 A.M. to 5 P.M. in Winter.

Block	Street	House	Number of Burners
10	Sprucestreet	{2, 4, 6	2
	"	8	150
	"	12/14	8
			160
	Williamstr.	179	6
	"	177	4
	"	175	2
	"	171	1
	Corner William & Beekmanstreet		2
			15
	Beekmanstreet	36	2
	"	34	2
	"	32	8
	"	30	22
	"	28	8
	"	24	23
	"	20	3
	"	14	1
	Corner Nassau & Beekmanstreet		2
			71
	Nassaustreet	140	2
	"	142	5
	"	144	1
	"	146	1
	"	148	2
	"	{146–148 150–152	25
	"	152	8
			44
20	Sprucestreet	26	1
	"	28-30	4
	"	34	4
	"	36	4
	Corner Sprucestr. & Goldstreet		2
			15
			305

Block	Street	House	Number of Burners
	Corner Gold & Beekmanstr.		305
			6
			6
	Beekmanstreet	56	4
	"	54	4
	"	46	1
	"	44	10
	Corner Beekman & Williamstreet		4
			23
	Williamstreet	176	2
	"	178	2
			4
25	C. Ferry and Goldstreet		3
	Ferrystreet	10	1
	"	26/28	1
	C. Ferry & Cliffordstreet		2
			7
	Cliffordstreet	67	2
	"	65	9
			11
	Beekmanstreet	88/90	12
	"	84	3
	"	82/84	14
	"	76	8
	"	74	10
	"	72	6
	"	70	8
	C. Gold & Beekmanstreet		1
			62
28	Goldstreet	80	1
			1
	Corner Ferry & Cliffordstreet		1
			1
	Pearlstreet	301	5
			5
			420

Block	Street	House	Number of Burners
			420
	Pearlstreet	293	1
	"	291	3
	C. Pearl & Beekm: Street		6
			15
	Beekmanstreet	96	2
	"	94	3
	"	92	2
	C: Beekman & Cliffordstr.		
			7
	Cliffordstreet	62	2
	"	70	1
			3
35	Waterstreet	236	3
	C. Beekm: & Waterstreet		6
			9
	Pearlstreet	294	2
	"	302	5
	"	304	2
	"	308	1
	"	310	3
	"	300	3
			10
43	Frontstreet	228/230	4
	"	226	2
			6
	C. Beekman & Waterstreet		6
			6
	Waterstreet	239/241	2
			2
51	Southstreet	112	1
	"	109	1
	"	108	1
	"	105	2
			5
	C. South & Beekmanstreet		1
			1
			490

Block	Street	House	Number of Burners
			490
50	C. Fultonmarket Beekm:		1
	C. " Frontstreet		1
	" " Fultonstreet		6
	" " Southstreet		2
	Fultonmarket	88/89	3
	2 C. Fultonmarket & Southstr:		2
	2 C. " Fultonstr:		1
	C. Fult. M. Beekm: & Fultonstr.		—
	C. Beekm. & Frontstr:		4
	" " " & Fulton M.		2
	" Frontstr: Fulton M.		13
	" " Fultonstr. "		4
	C. Fultonstr: Fulton M:		~~4~~
	C. Fulton & Southstr:		4
	Fultonmarket	211	2
	"	212	1
	"	214/216	—
	"	216	2
	"	233	1
	"	231	1
	"	224/226	3
	"	194/195	4
	"	163/165	5
	"	111–123	5
	"	125–127	8
	"	152/153	2
	"	166/167	3
	"	161/162	3
	"	132/135/160	3
	"	93/94	12
	"	117/118	2
	"	172	2
	"	176	1
	"	150/151	3
	"	177/178	5
	"	182/183	2
	"	184/185	4
	"	202/203	4
	"	186/187	4
			125
			490

Block	Street	House	Number of Burners
			490
			125
	Fultonmarket	188/189	1
	Fishmarket-Southstreet		48
	Oppos: Fult. M. Southstr. Side		56
	Corn: Beekman & Frontstr:		1
			106
42	Beekmanstr.	123	8
			8
	Waterstreet	213/215	2
			2
	Fultonstreet	19	7
	C. Pearlstreet & Beekm: Str.		16
			23
	Pearlstreet	280	1
	"	278	2
	"	274	1
	"	272	24
	C. Fulton & Pearlstreet		4
			32
	~~33/4~~		
	Fultonstreet	33/34	1
	"	31	3
	C. Fultonstr: Waterstr:		8
			12
	Waterstreet	206	5
			5
27	C. Beekm: & Cliff. Str:		1
			1
	Cliffordstreet	48	2
	"	53	4
	"	47	7
	C. Fulton & Pearlstr:		6
			19
	Fultonstreet	41	2
			2
	C. Fulton & Pearlstreet		5
			5
	Pearlstreet	271	1
			705

Block	Street	House	Number of Burners
			705
	Pearlstreet	273	4
	"	279	1
	"	283	3
			9
24	Beekmanstreet	87/89	4
	"	85	1
	"	83	2
	"	81	3
	"	79	2
	"	77	11
	"	75	1
	"	73	1
	C. Beekm: & Fultonstr:		18
	Beekmanstr:	67/69	1
	C. Beekm: & Goldstr.	65	1
			45
	Goldstreet	64	1
	"	62/64	1
	"	56/58	1
	1/ C. Gold & Fultonstreet		10
			13
	2/ C. Gold & Fultonstreet		10
	Fultonstreet	69	4
	"	63	1
	"	61	3
	"	59	5
	"	57	4
			27
19	Beekmann	59	11
	"	57	1
	"	55	5
	"	53	4
	"	51	2
	"	49	3
	"	47	2
	"	45	4
	C. Beekm: & Williamstr:		16
			43
			542

Block	Street	House	Number of Burners
			842
	Williamstreet	164	6
	"	162	3
	"	160	9
	"	158	5
	C. William & Annstr.		15
			38
	Annstreet	79	6
			6
	Beekmanstr.	59	2
			2
18.	Annstreet	86	2
	C. Fulton & Annstreet		35
			37
	C. Ann & Williamstreet		2
	Williamstreet	152	4
	"	150	4
	"	148	4
	"	146/148	2
			10
	C. William & Fultonstr.		5
	Fultonstreet	97	10
	"	95	2
	"	87	9
	"	85	1
			27
	C. Fulton & Goldstr.		2
			2
9	C. Beekm. & Williamstr.		1
	Beekmanstr.	33	5
	"	31	19
	"	29	3
			25
			970

Block	Street	House	Number of Burners
			970
			28
	Beekmanstr.	27	7
	"	25	3
	"	23	12
	"	21	6
	"	19	6
	"	15/17	35
	C. Nassau & Beekm.str.		1
			98
	Nassaustr.	132	1
	"	124/126	1
	"	122	4
	"	120	8
	"	116	3
	"	118	2
	"	114	3
			22
	C. Nassau & Annstr.		1
	Annstreet	39	1
	"	39/41	1
	"	41	4
	"	43	1
	"	45	1
	"	49	2
	"	51	3
	"	53	4
	"	55	1
	"	57	4
	"	rear 59	2
	"	59	3
	"	57/59	3
	C. Ann & Williamstr.		3
			34
	Williamstr.: [illegible]		7
			7
			1124

Block	Street	House	Number of Burners
			1124
			7
	Williamstreet	163	3
	"	167	5
	C. William & Annstr.		2
			17
8	Annstreet	62	2
	"	60	6
	1. C. Ann & Fultonstr.		18
	2. " " "	54/115	12
	" "	52/117	4
	Annstreet	50	6
	"	48	2
	"	46	1
	Ann & Fultonstr.	42/117	6
	Annstreet	42	1
	C. Annstr. & Nassaustr.		10
			68
	Nassaustreet	102	2
	C. Ann & Nassaustr.		14
	Nassaustreet	100	9
	"	98	4
	C. Nassau & Fultonstr. ~~40~~		41
			70
	Fultonstreet	125	26
	"	123	6
	"	119	2
	"	117	8
	"	109	4
	"	105	3
	C. William & Fultonstr.		33
			82
	Williamstreet	149	5
	"	139	3
			8
			1361

Block	Street	House	Number of Burners
			1361
			8
	Williamstreet	135/137	5
	"	133	4
	"	131	13
	"	127/129	6
	"	123	1
	"	119/121	12
	Cor: of John and "	115/117	13
			62
6.	C. Fulton & Nassaustr.		4
	Fultonstr.	124	3
	"	122	15
	"	120	8
	"	118	18
	"	116	21
	"	114	27
	C. Fulton & Dutchstr.		6
			102
	Dutchstreet	17	2
	"	15	3
	"	9/11/13	8
	"	5	3
	C. Dutchstr. & Johnstreet		11
			27
	Johnstreet	47	4
	"	45	1
	"	43	2
	"	41	19
	"	39	7
	"	37	4
	"	35	4
	C. Nassaustr. & Johnstr.		7
	Johnstreet	33	2
			50
			1602

Block	Street	House	Number of Burners
			1602
	Nassaustreet	74	1
	"	76	2
	"	78	1
	"	80	2
	"	84	14
	"	86	9
	"	88	3
			32
7	C. Dutch & Fultonstreet		5
	Fultonstreet	110	1
	"	106/108	40
	"	104	25
	"	102	8
	"	100	3
			82
	C. John & Williamstreet		8
	Johnstreet		15
	C. John & Dutchstreet		21
			44
	Dutchstreet	12	6
	"	16	2
			8
17	C. William & Fultonstreet		9
	Fultonstreet	96	1
	"	94	7
	"	92	10
	"	90	9
			36
	Goldstreet	45	3
	"	43	1
			4
			1804

Block	Street	House	Number of Burners
			1804
			4
	Goldstreet	33	1
	"	29/31	1
	C. Gold & Johnstreet		2
			8
	Johnstreet	83	2
	"	79	22
	"	77	16
	"	75	1
	"	71	4
	C. John & Williamstreet		2
			47
	Williamstreet	116	3
	"	118	1
	"	126	2
	"	128	1
	"	130	2
	"	134/136	15
	"	138	6
			30
23	Fultonstreet	76	1
	"	74	1
	"	70/76	30
	Ryders-Alley-Goldstr.	48	1
	C. Ryders Alley-Fultonstr.		4
	Fultonstreet	66/68	1
	"	64	9
	"	62	3
	"	60	1
	"	58	4
	"	58/60	4
	C. Fulton & Cliff-str.		8
			67
			1956

Block	Street	House	Number of Burners
			1956
	Cliffstreet	27	12
	"	25	6
	"	23	8
	"	21	2
	"	19	4
	"	11	8
	"	11/13	4
	"	7/9	20
			64
	~~C. Johnstr. & Cliffstr.~~		~~4~~
	C. Johnstr. & Cliffstr.		14
	Johnstreet	95	1
	"	93	2
			14
	Goldstreet	30	1
	"	38	2
	"	40/42	2
	"	44	1
			6
26	Fultonstreet	50	2
	"	46	1
	"	44	2
	C. Fulton & Pearlstreet		7
	Fultonstreet	40	3
			15
	Pearlstreet	257	5
	"	255	2
	"	251	14
	"	245	2
	"	243	4
	C. Pearl & Johnstreet		1
	Johnstreet	113	2
			30
			2085

Block	Street	House	Number of Burners
			2085
	Cliffstreet	18	3
	"	24	1
	"	26	3
	"	28	2
	"	32	1
			10
	—	~~34~~	
33	C. Fulton & Pearlstreet		3
	Fultonstreet	36	1
	C. Fulton & Waterstreet		1
			5
	C. Pearl-, Fulton & Waterstreet		20
	Waterstreet	194	2
	"	186/190	6
			28
	Pearlstreet	242	4
	"	244	2
	"	246	1
	"	254	14
	"	258/260	36
	"	262	7
			64
41	Fultonstreet	22	1
	C. Fulton & Frontstreet		2
	Frontstreet	198	1
	"	194	2
	"	192	2
	"	186	3
			11
	Burling Slip	27	1
			1
			2204

Block	Street	House	Number of Burners	
				2204
	Waterstreet	185/187	1	
	"	197	1	2
49	C. Fulton & Frontstreet		10	
	Fultonstreet	12	1	
	"	10	6	
	"	204/206	20	
	C. Fulton & Southstr.		5	42
	Southstreet	92	3	
	"	91	4	
	"	90	1	8
	Burling Slip	31/35	6	
	"	29	1	
	C. Frontst. & Burling Sl.		1	8
	~~Frontstr.~~			
	Frontstreet	189/191	2	2
48	C. Southstr. & Burling Slip		2	
	Burling Slip	32	5	7
	C. Front & Fletcherstr.		4	4
	Southstreet	76	1	
	C. Southstr. & Fletcherstr.		4	
	Southstreet	83	4	
	"	85	2	11
				2277

Block	Street	House	Number of Burners	
				2277
				11
	Southstreet	86	1	12
47	C. Maidenlane & Southstr.		2	2
40	C. Burling Slip & Waterstr.		2	2
	Waterstreet	177	2	
	"	173	1	
	"	171	1	4
	Fletcherstreet	22	1	1
39	C. Waterstr. & Maidenlane		1	1
	Maidenlane	137	1	
	C. Frontstr. & Maidenlane		1	2
32	Pearlstreet	226	1	
	"	222	1	
	"	220	1	
	"	218	2	
	"	216	1	
	"	214	12	18
	Fletcherstr.	4	2	2
				2321

Block	Street	House	Number of Burners	
				2321
	Waterstreet	166	3	
	"	178	1	4
31	Fletcher & Pearlstr.		1	1
	Maidenlane	129	2	
	C. Maidenlane & Waterstr.		1	3
22	Johnstreet	108	1	
	"	104/106	4	
	"	104	3	
	C. John & Plattstreet		4	
	Johnstreet	98	3	
	"	96	2	
	"	94	3	
	C. John & Goldstreet		1	21
	C. Gold & Plattstreet		4	
	Plattstreet	13	1	
	"	3	1	
	C. Platt & Pearlstreet		2	8
	Pearlstreet	227	1	
	"	231	2	3
21	C. Platt & Pearlstr.		4	
	Plattstr.	8/10	3	7
				2361

Block	Street	House	Number of Burners	
				2361
				7
	Plattstreet	12	1	
	"	14	1	9
	Goldstreet	7,8,10	25	
	"	8	2	27
	Maidenlane	97	5	5
	Pearlstreet	203	5	
	"	209	3	
	"	215	2	
	"	217		10
16	Johnstreet	86	2	
	"	84	7	
	"	82	2	
	"	80	2	
	"	78	3	
	"	76	8	
	"	74	2	
	"	72	1	27
	Williamstreet	106	4	
	"	104	6	
	"	102	1	
	"	98	1	12
	Goldstreet	21	1	1
15	C. Platt & Goldstreet		2	2
				2452

Block	Street	House	Number of Burners
			2452
			2
	C. Plattstreet	28	1
			3
	Williamstr.	90	2
	"	88	2
	"	86	1
	C. Williamstr. & Maidenlane		2
			7
	C. Maidenlane	67	1
	"	73	1
	"	81	3
	"	83	1
			6
	Goldstreet	9	6
	"	13	1
	C. William- Johnstreet		5
			12
5.	Johnstreet	64	4
	C. John & Williamstreet		3
	Johnstreet	62	4
	"	60	3
	"	58	3
	"	56	6
	"	50	12
	"	48	1
	"	42	9
	"	36	2
	"	34	5
	C. Nassau & Johnstreet		3
			55
			2535

Block	Street	House	Number of Burners
			2535
	Nassaustreet	68	5
	"	66	7
	"	64	3
	"	62	7
	C. Maidenlane & Nassaustr.		13
			35
	Maidenlane	31	16
	"	33	6
	"	35	11
	"	37	12
	"	39	17
	"	41	10
	"	43	10
	"	45	6
	"	47	4
	"	49	5
	"	51	14
	"	53	1
	"	55	3
	"	57	10
	"	59	7
	"	59/61	5
	"	61	4
	"	63	9
			150
	Williamstreet	87	2
	"	93	1
	"	95	6
	"	99/101	4
	"	99	7
	"	103/105	1
			21
			2741

Block	Street	House	Number of Burners
			2741
4.	C. Maidenlane & Nassaustr.		5
	Maidenlane	30	1
	"	32	2
	"	36	6
	"	38	2
	"	40	3
	"	42	2
	"	44	4
	"	44½	4
	"	46	12
	"	48	13
	"	50	5
	"	52	2
	"	54	8
	"	56	1
	"	60	1
	C. Maidenlane & Williamstr.		7
			78
	C. Libertyst. & Williamstr.		10
	Libertystr.	31	1
	"	39	2
	"	41	1
	"	43	10
	"	47/49	12
	"	51	4
	C. Nassau- Libertystr.		1
	Nassaustr.	42/46	1
	"	42	3
	"	48/50	2
	"	50	4
			51
			2870

Block	Street	House	Number of Burners
			2870
14.	C. Maidenlane, Willi. Libertystr.		12
			12
	Maidenlane	70	2
	"	74	7
	C. Maidenlane Libertystr.		3
			12
3.	C. Nassau & Libertystr.		1
	C. Liberty, Nassau, Cedarstr.		6
			7
	Libertystr.	36	2
	"	30	4
	"	24	12
	"	20	2
	C. Liberty- Williamstr.		2
			22
	Williamstr.	75	4
	"	73	8
	"	71	1
	C. William- Cedarstr.		2
			15
	Cedarstreet	45	3
	"	47	8
	"	51	4
	"	55	9
	"	57	10
	"	59	6
	"	61	6
			46
13.	Maidenlane	86	3
			3
			2984

Block	Street	House	Number of Burners
			2984
1	Maidenlane	88	40
	"	90/94	4
	"	102	2
	C. Md. Lane & Pearlstr:		9
			58
	Cedarstreet	3	2
	"	17	8
	C. William & Cedarstreet		14
			24
	Williamstreet	72	4
	"	74	6
	"	76	2
			12
30	C. Maidenlane & Pearlstr:		1
			1
	Waterstreet	136	16
			16
	Pearlstreet	174/176	8
	"	182/186	16
	"	188	8
	"	192	6
			38
38	Frontstreet	152	1
	"	146	2
			3
44	Frontstreet	145	1
	"	151	1
			2
	C. Frontstr. & Wallstr.		2
			2
			3138

Block	Street	House	Number of Burners
			3138
37	~~C. Depeyster & Pinestr.~~		~~15~~ 2
	Maidenlane	166	2
	"	168	2
			6
	Southstr.	73/74	1
	~~C. Depeyster & Southstr.~~		1
	Depeysterstr.	36	1
	C. Depeyster & Frontstr.		1
			2
	Frontstr.	141	1
	"	143	2
			3
37	C. Depeyster & Pinestr.		15
			15
36	C. Water & Pinestr:		9
7			9
	Frontstreet	132	2
	C. Pinestreet & Frontstr:		2
			4
	Waterstreet	133	1
	"	133	1
	"	127/129	9
	"	127	1
	"	123/125	13
	"	121	16
	C. Wallstr. & Waterstr:		6
			47
	Wallstreet	92	2
	"	96	2
	"	102/104	2
			6
			3231

Block	Street	House	Number of Burners
			3236
	C. Front & Wallstreet: (Continuation in Block 18 yet not calculated).		3
			3
45	C. South & Pinestreet		3
			3
	Pinestreet	90	6
			6
	C. Front & Pinestreet		3
	Frontstreet	135	3
			6
46	Pinestreet	95	1
	C. Front & Pinestr:		1
			2
	Frontstreet	129	2
	"	125/127	12
	"	121/123	12
	"	119	3
			29
	~~"~~	~~117~~	
	Wallstreet	108	3
	"	110	1
	"	112	2
	"	114	5
	"	116	2
	"	118	2
	C. South & Wallstreet		1
			16
	Southstreet	61	2
	"	62	1
	"	65	1
			4
			3296

Block	Street	House	Number of Burners
			3296
	Southstreet	66	1
	"	67	4
			9
			3305
36 Contin:	Frontstreet		23
29	Waterstreet		21
	Pinestreet		7
	Pearlstreet		18
	Wallstreet		20
12	Cedarstreet		6
	Williamstreet		7

Hoistways and Elevators:

Hoistways:	553	driven by Hand etc:
	1	" " Steam
	57	" " " probably.
	No 611	

Elevators:	13	driven by Water etc:
	32	" " Steam
	9	" " " probably
	No 54	

Blanks 1, 2, 11 yet not received.

1 Hoistway = 7 Lamps = 1 Horsepower

1 Elevator = 35 " = 5 " "

Average paid per month for Gas, arrounded on half or full Dollars:

Block 10.	Block 20.	Block 25	Block 28
2 à ½ $	1 à ½ $	2 à ½ $	1 à ½ $
3 " 1 "	8 " 1 "	4 " 1 "	1 " 1 "
4 " 1½ "	3 " 1½ "	4 " 1½ "	1 " 2 "
5 " 2 "	5 " 2 "	7 " 2 "	1 " 2½ "
2 " 2½ "	3 " 2½ "	2 " 2½ "	2 " 4 "
4 " 3 "	7 " 3 "	1 " 3 "	2 " 5 "
3 " 3½ "	2 " 3½ "	1 " 3½ "	1 " 5½ "
3 " 4 "	1 " 5 "	3 " 4 "	1 " 6 "
3 " 5 "	2 " 6 "	1 " 5 "	2 " 7 "
1 " 6 "	1 " 7 "	1 " 6 "	2 " 7½ "
3 " 7 "	3 " 8 "	1 " 7 "	2 " 9 "
1 " 10	1 " 10 "	1 " 8 "	1 " 13½ "
2 " 12	1 " 12 "	2 " 9 "	1 " 14½ "
2 " 18	1 " 25 "	3 " 11 "	1 " 35½ "
1 " 20	1 " 200	1 " 12 "	19
1 " 21	84	1 " 15	
1 " 22		1 " 20	
1 " 25		1 " 25	
1 " 28		1 " 50	
2 " 30		1 " 75	
1 " 55		33	
1 " 80			
1 " 200			
50			

Block 35.

3 à ½ $
4 " 1 "
2 " 1½ "
[illegible] " 2 "
1 " 2½ "
1 " 3 "
2 " 4 "
1 " 6½ "
2 " 8 "
1 " 9 "
3 " 10 "
1 " 11 "
2 " 12 "
1 " 14½ "

29

Block 43.

3 à ½ $
7 " 1 "
1 " 1½ "
2 " 2 "
2 " 2½ "
2 " 3 "
2 " 4 "
1 " 5 "
2 " 8 "
1 " 11 "
1 " 15 "
1 " 21

25

Block 51.

1 à ½ $
2 " 1½ "
1 " 4 "
3 " 5 "
1 " 6 "
1 " 7 "
1 " 9 "
2 " 11 "
1 " 12 "
1 " 15 "
1 " 16½ "
1 " 38 "
1 " 43½ "
1 " 49 "

18

Block 50.

1 à ½ $
3 " 1 "
5 " 1½ "
7 " 2 "
7 " 2½ "
21 " 3 "
2 " 3½ "
6 " 4 "
6 " 4½ "
3 " 5 "
2 " 5½ "
3 " 6 "
1 " 7 "
3 " 9 "
1 " 10 "
1 " 12 "
1 " 15 "
1 " 16 "
1 " 18½ "
1 " 26½ "
1 " 35 "
1 " 45 "
1 " 50 "
1 " 80 "
1 " 154½ "

81

Block 42.

1 à ½ $
2 " 1 "
2 " 2 "
2 " 2½ "
1 " 4 "
1 " 4½ "
1 " 6 "
1 " 9 "
1 " 13½ "
1 " 15 "
1 " 15½ "
1 " 16½ "
1 " 180 "

16

Block 34.

2 à 1 $
3 " 1½ "
4 " 2 "
3 " 2½ "
2 " 4 "
2 " 4½ "
1 à 5½ "
1 à 6½ "
1 " 10 "
1 à 15½ "
1 à 17 "
2 à 21 "
1 " 28 "
1 " 123 "

25

Block 27.

3 à ½ $
6 " 1 "
3 " 1½ "
2 " 2 "
1 " 2½ "
1 " 3 "
1 " 3½ "
2 " 4 "
3 " 4½ "
4 " 5 "
3 " 5½ "
1 " 9½ "
1 " 10 "
1 " 12½ "
1 " 13 "
1 " 13½ "
1 " 17½ "
1 " 23 "
1 " 25 "
1 " 47 "

38

Block 24.

3 à ½ $
4 " 1 "
1 " 1½ "
3 " 2 "
1 " 2½ "
5 " 3 "
1 " 3½ "
5 " 4 "
1 " 4½ "
3 " 5 "
4 " 5½ "
1 " 6 "
2 " 8 "
1 " 9 "
3 " 10 "
3 " 10½ "
1 " 11½ "
1 " 12 "
1 " 14 "
1 " 15 "
2 " 16 "
2 " 18 "
1 " 30 "
1 " 40 "
1 " 54½ "
1 " 72½ "

53

Block 19.

5 à 1 $
2 " 1½ "
1 " 2½ "
6 " 3 "
1 " 3½ "
1 " 4 "
2 " 4½ "
3 " 5 "
2 " 5½ "
1 " 9 "
3 " 9½ "
1 " 14½ "
1 " 20 "
1 " 26½ "
2 " 50 "
1 " 56½ "

33

Block 18.

4 à 1 $
2 " 1½ "
4 " 2 "
1 " 2½ "
3 " 4 "
1 " 4½ "
1 " 5½ "
1 " 6 "
2 " 6½ "
1 " 7 "
1 " 12 "
1 " 12½ "
1 " 13 "
1 " 15½ "
2 " 16½ "
1 " 200

22

Block 9.

2 à ½ $
11 " 1 "
6 " 1½ "
8 " 2 "
4 " 2½ "
8 " 3 "
3 " 3½ "
2 " 4 "
3 " 4½ "
1 " 5
3 " 5½ "
2 " 7
2 " 7½ "
2 " 8 "
4 " 9 "
2 " 10½ "
1 " 15 "
1 " 19
1 " 23 "
1 " 25 "
1 " 38
1 " 51½

64

Block 8

1 à ½ $
6 à 1 "
4 " 1½ "
1 " 2 "
1 " 2½ "
2 " 3 "
4 " 3½ "
1 " 4 "
2 " 4½ "
4 " 5 "
1 " 6 "
1 " 7 "
2 " 7½ "
2 " 8 "
1 " 8½ "
1 " 9
3 " 9½ "
2 " 10 "
1 " 10½ "
2 " 13 "
1 " 13½ "
1 " 15 "
2 " 16 "
1 " 18 "
1 " 19 "
1 " 20 "
1 " 22 "
1 " 22½
1 " 25

~~13~~
1 à 31½
1 " 33½
1 " 34
1 " 37½
1 " 40½
1 " 53
1 " 58

66

Block 6.

4 à ½ $
8 " 1 "
2 " 1½ "
5 " 2 "
4 " 2½ "
4 " 3 "
4 " 3½ "
3 " 4 "
2 " 4½ "
1 " 5 "
3 " 5½ "
5 " 6 "
1 " 6½ "
1 " 7 "
1 " 7½ "
6 " 8 "
2 " 8½ "
1 " 9 "
1 " 9½ "
2 " 10 "
1 " 11 "
2 " 11½ "
1 " 12½ "
2 " 13 "
1 " 16 "
1 " 20½ "
2 " 23 "
1 " 25 "
1 " 26½ "
1 " 53 "
1 " 54 "
1 " 62½ "

75

Block 7

1 à ½ $
3 " 1 "
1 " 1½ "
2 " 2½ "
1 " 3 "
1 " 3½ "
2 " 4 "
1 " 4½ "
1 " 11 "
2 " 15½ "
1 à 25 "
1 " 28 "
1 à 31½ "
1 à 33½ "
1 à 53½ "

20

Block 17

5 à ½ $
9 " 1 "
8 " 1½ "
5 " 2 "
3 à 2½ "
7 " 3 "
3 " 3½ "
2 " 4 "
5 " 4½ "
2 " 5½ "
2 " 6 "
4 " 7
3 " 8 "
1 " 8½ "
1 " 10 "
3 " 10½ "
1 " 15½ "
1 " 19 "
1 " 27 "
1 " 67 "

70

Block ~~2~~ 23

3 à ½ $
5 " 1 "
6 " 1½ "
7 " 2 "
2 " 2½ "
4 " 3 "
1 " 3½ "
3 " 4 "
1 " 4½ "
2 " 5 "
2 " 6 "
1 " 6½ "
1 " 8 "
1 " 8½ "
2 " 9½ "
1 " 10 "
1 " 10½ "
2 " 11½ "
7 " 13½ "
1 " 14½ "
1 " 16 "
2 " 16½ "
1 " 19 "
2 " 23 "
1 " 24 "
1 " 27 "

55

Block 26.

8 à $\frac{1}{2}$ \$
4 " 1 "
4 " $1\frac{1}{2}$ "
2 " 2 "
3 " $2\frac{1}{2}$ "
1 " 3 "
1 " $3\frac{1}{2}$ "
6 " 4 "
1 " $4\frac{1}{2}$ "
3 " $5\frac{1}{2}$ "
2 " 7 "
2 " 8 "
1 " $8\frac{1}{2}$ "
1 " $14\frac{1}{2}$ "
1 " 16 "
1 " 19 "
1 " $24\frac{1}{2}$ "
42

Block 33.

2 à $\frac{1}{2}$ \$
3 " 1 "
1 " $1\frac{1}{2}$ "
1 " 2 "
1 " $2\frac{1}{2}$ "
2 " 3 "
1 " 4 "
1 " $4\frac{1}{2}$ "
1 " 5 "
1 " $8\frac{1}{2}$ "
1 " $9\frac{1}{2}$ "
1 " $16\frac{1}{2}$ "
1 " $17\frac{1}{2}$ "
1 " 19 "
1 " $28\frac{1}{2}$ "
1 " 78 "
1 " $104\frac{1}{2}$
21

Block 41.

1 à $\frac{1}{2}$ \$
3 " 1 "
3 " $1\frac{1}{2}$ "
2 " 2 "
2 " $2\frac{1}{2}$ "
1 " 4 "
2 " $4\frac{1}{2}$ "
1 " $5\frac{1}{2}$ "
1 " 7 "
1 " 8 "
1 " $12\frac{1}{2}$ "
18

Block 49.

1 à 1 \$
4 " $1\frac{1}{2}$ "
3 " 2 "
1 " $2\frac{1}{2}$ "
1 " 3 "
1 " 6 "
1 " $6\frac{1}{2}$ "
1 " $7\frac{1}{2}$ "
1 " $8\frac{1}{2}$ "
1 " $9\frac{1}{2}$ "
1 " $12\frac{1}{2}$ "
1 " 19 "
1 " 22 "
1 " $29\frac{1}{2}$ "
1 " $49\frac{1}{2}$ "
20

Block 48.

3 à $\frac{1}{2}$ \$
4 " 1 "
3 " $1\frac{1}{2}$ "
2 " $2\frac{1}{2}$ "
1 " 4 "
1 " $4\frac{1}{2}$ "
1 " 7 "
1 " 8 "
1 " $9\frac{1}{2}$ "
2 " 10 "
1 " $12\frac{1}{2}$ "
20

Block 47.

4 à 1 \$
1 à $21\frac{1}{2}$ "
8

Block 40.

4 à $\frac{1}{2}$ \$
6 " 1 "
6 à $1\frac{1}{2}$ "
2 " 2 "
2 " $2\frac{1}{2}$ "
1 " 4
21

Block 39.

1 à 1 \$
1 à $1\frac{1}{2}$ "
1 " 2 "
1 " $2\frac{1}{2}$ "
1 " 4 "
1 " $5\frac{1}{2}$ "
6

Block 32.

1 à ½ $
4 „ 1 „
4 „ 1½ „
1 „ 2 „
1 „ 2½ „
2 „ 4 „
1 „ 7 „
1 „ 12½ „
1 „ 50 „
26

Block 31.

1 à ½ $
2 „ 1 „
1 „ 1½ „
2 „ 2½ „
1 „ 4½ „
1 „ 5 „
1 „ 6 „
9

Block 22.

3 à ½ $
5 „ 1 „
3 „ 1½ „
5 „ 2 „
2 „ 2½ „
1 „ 3 „
1 „ 4 „
1 „ 5½ „
3 „ 6 „
1 „ 8½ „
3 „ 9½ „
1 „ 12 „
1 „ 20½ „
30

Block 21.

12 à ½ $
6 „ 1 „
6 „ 1½ „
4 „ 2 „
2 „ 2½ „
1 „ 3 „
5 „ 3½ „
1 „ 4 „
3 „ 4½ „
3 „ 5½ „
1 „ 13½ „
1 „ 77 „
45

Block 16.

2 à 1 $
2 „ 1½ „
4 „ 2 „
1 „ 2½ „
2 „ 3 „
1 „ 3½ „
3 „ 4 „
1 „ 4½ „
1 „ 5 „
1 „ 5½ „
1 „ 6 „
1 „ 7½ „
1 „ 10
1 „ 11½
1 „ 16½
1 „ 20
25

Block 15.

1 à ½ $
3 „ 1 „
4 „ 1½ „
1 „ 2 „
2 „ 2½ „
3 „ 3½ „
1 „ 5 „
2 „ 5½ „
1 „ 6 „
1 „ 7 „
2 „ 8½ „
1 „ 9½ „
1 „ 11½ „
1 „ 12 „
1 „ 17 „
26

Block 5.

3 à ½ $
8 „ 1 „
10 „ 1½ „
15 „ 2 „
5 „ 2½ „
10 „ 3 „
3 „ 3½ „
9 „ 4 „
5 „ 4½ „
2 „ 5 „
3 „ 5½ „
10 „ 6 „
3 „ 7 „
2 „ 7½ „
5 „ 8 „
7 „ 8½ „
1 „ 9 „
2 „ 9½ „
4 „ 10½ „
1 „ 11 „
1 „ 12½ „
1 „ 13 „
1 „ 13½ „
117

117

1 à 14½ $
1 „ 15 „
3 „ 15½ „
1 „ 17½ „
2 „ 22 „
1 „ 25 „
1 „ 29½ „
127

Block 4.

1 à ½ $
8 „ 1 „
12 „ 1½ „
9 „ 2 „
7 „ 2½ „
3 „ 3
1 „ 3½ „
3 „ 4 „
2 „ 4½ „
1 „ 5½ „
5 „ 6 „
2 „ 7 „
2 „ 7½ „
1 „ 8½ „
1 „ 9 „
1 „ 9½ „
1 „ 10 „
2 „ 10½ „
2 „ 12 „
3 „ 12½ „
1 „ 14½
1 „ 15½
1 „ 16½
1 „ 19
1 „ 23
1 „ 26
76

(Block 14.

1 à ½ $
2 " 1 "
1 " 1½ "
1 " 2½ "
1 à 5½ "
[illegible] " (1 à 8)
2 " 14½ "
1 " 16 "

6

Block 3.

1 à ½ $
2 " 1 "
1 " 1½ "
6 " 2 "
4 " 2½ "
1 " 3 "
3 " 3½ "
7 " 4 "
1 " 4½ "
1 " 5 "
1 " 5½ "
1 " 6 "
1 " 7½ "
1 " 8 "
2 " 8½ "
1 " 9½ "
1 " 13 "
1 " 14½ "
1 " 15 "
1 " 16½ "
1 " 17 "
2 " 21 "
1 " 27 "
1 " 41½ "

43

Block 13.

6 à ½ $
6 " 1 "
3 " 1½ "
3 " 2 "
5 " 2½ "
3 " 3 "
2 " 3½ "
4 " 4 "
1 " 4½ "
1 " 5 "
2 " 5½ "
1 " 6 "
2 " 8 "
1 " 8½ "
1 " 9 "
2 " 10½ "
1 " 12½ "
1 " 15 "
1 " 16½ "
1 " 39 "
1 " 125 "

48

Block 30.

3 à ½ $
7 " 1 "
3 " 1½ "
2 " 2 "
2 " 5½ "
1 " 7 "
1 " 11 "
1 " 12 "
1 " 15½ "
1 " 21

22

Block 38.

2 à 1 $
2 " 1½ "
1 " 2½ "
1 " 3 "

6

Block 44.

2 à ½ $
4 " 1 "
2 " 1½ "
2 " 3 "
2 " 4 "
1 " 6 "
2 " 8½ "
1 " 12½ "

16

Block 37.

1 à 27 $
~~3 "~~

Block 17.

3 à ½ $
9 " 1 "
11 " 1½ "
1 " 2 "
2 " 2½ "
1 " 3 "
1 " 3½ "
2 " 4 "
1 " 4½ "
1 " 5½ "
2 " 8½ "
1 " 9½ "
1 " 10 "
1 " 14½ "
1 " 15½ "
1 " 93

39

Block 45.

3 à 1 $
2 " 4 1/2 "
1 " 9 "
1 " 16 1/2 "

8

Block 46.

9 à 1/2 $ 100
6 " 1 " 211
12 " 1 1/2 " 106
4 " 2 1/2 "
3 " 3 "
1 " 3 1/2 "
3 " 4 "
1 " 4 1/2 "
1 " 5 "
1 " 5 1/2 "
4 " 6 "
1 " 7 "
1 " 7 1/2 "
1 " 8 1/2 "
1 " 9 "
1 " 9 1/2 "
1 " 11 "
1 " 39 "

52

Block 36 Centim:

2 à 1/2 $
4 . 1 "
4 . 1 1/2 "
2 . 2 "
1 . 2 1/2 "
1 . 4 1/2 "
1 . 6 "
1 . 7 "
1 . 14 "

17

Block 29.

8 à 1/2 $
6 . 1 "
5 . 1 1/2 "
5 . 2 "
1 . 2 1/2 "
1 . 3 "
3 . 3 1/2 "
1 . 4 1/2 "
1 . 6 "
1 . 6 1/2 "
1 . 7 "
1 . 7 1/2 "
1 . 8 "
1 . 10 "
2 . 14 "
1 . 19 "
1 . 31 "
1 . 51 1/2 "

41

Block 12

3 à 1/2 $
5 . 1 "
4 . 1 1/2 "
2 . 2 "
4 . 2 1/2 "
1 . 3 1/2 "
2 . 4 "
1 . 5 1/2 "

~~18~~
22

Number of Burners in Winter

Block	Street	6-7	7-8	8-9
10	Sprucestreet	163	153	3
	Williamstreet	13	18	20
	Beekmanstreet	65	61	46
	Nassaustreet	15	16	15
		256	248	84
20	Sprucestreet	6	6	6
	Goldstreet	4	4	4
	Beekmanstreet	1	1	1
	Williamstreet	5	5	5
		16	16	16
25	Ferrystreet	2	2	2
	Beekmanstreet	32	20	20
	Goldstreet	—	—	—
		34	22	22
28	Ferrystreet	15	15	15
	Pearlstreet	9	11	11
	Beekmanstreet	—	—	—
	Cliffstreet	5	5	5
		29	31	31
35	Peckslip	—	—	—
	Waterstreet	—	—	—
	Beekmanstreet	3	9	9
	Pearlstreet	19	19	2
		22	28	11
43	Peckslip	1	7	1
	Frontstreet	11	11	—
	Beekmanstreet	1	4	—
	Waterstreet	—	—	
		13	22	1
51	Peckslip	12	17	17
	Southstreet	78	78	59
		90	95	76

Block	Street	6-7	7-8	8-9
		90	95	76
	Beekmanstr.	—	—	—
	Frontstr.	12	12	12
		102	107	88
50	Fulton Mt.	325	215	211
		325	215	211
42.	Beekm: Str.	19	16	16
	Waterstreet	11	11	11
	Fultonstr.	81	23	23
	Frontstreet	77	2	2
		188	52	52
34	Beekm: Str.	3	3	3
	Pearlstreet	12	7	6
	Fultonstreet	59	12	20
	Waterstr.	5	—	—
		79	22	29
27	Beekm: Str.	7	—	—
	Cliffstr.	11	1	1
	Fultonstr.	58	19	9
	Pearlstreet	21	—	—
		97	20	10
24	Beekm: Str.	—	—	—
	Goldstreet	4	4	—
	Fultonstr.	86	34	3
	Cliffstr.	—	—	—
		90	38	3
19	Beekm: Str.	18	15	15
	Williamstr.	20	8	6
18	Annstreet	38	28	20
	Williamstr.	21	21	21
	Fultonstr.	51	45	14
	Goldstreet	7	7	3
		[illegible]	58	[illegible] 58

38. 23. 21.

Block	Street	6-7	7-8	8-9	Block	Street	6-7	7-8	8-9
9	Beekm: Str:	36	36	8					
	Nassaustreet	52	22	7					
	Annstreet	47	13	5					
	Williamstreet	18	10	10					
		153	81	30					
8	Annstreet	108	75	54					
	Nassaustreet	70	43	16					
	Fultonstreet	58	8	8					
	Williamstreet	3	3	3					
		239	129	81					
6	Fultonstreet	185	101	101					
	Dutchstreet	25	20	1					
	Johnstreet	22	13	13					
	Nassaustreet	86	35	19					
		318	169	134					
7	Fultonstreet	64	8	2					
	Johnstreet	2	2	2					
	Dutchstreet	19	9	–					
		85	19	4					
17	Fultonstreet	79	40	7					
		79	40	7					
	Totale	2270	1383	893					

Block	Street	6-7	7-8	8-9	Block	Street	6-7	7-8	8-9

Menlo Park Notebook #133 [N-80-00-01]

This notebook is undated but was probably used in 1880 or 1881. The entries are probably by William Carman and consist of "references to note books found by Messrs Edison & Batchelor." The label on the front cover is marked "Wm Carman" [crossed out], "References," and "Private" [crossed out]. The book contains 284 numbered pages.

Blank pages not filmed: 24-283.

Missing page numbers: 1-6.

References to note books - found
by Messrs Edison & Batchelor -

Ground glass top plat lamp
Vol. 25 Page 65

Test of Reg Dynamo with Fairbanks Scales
Vol 30 Pge 35 - July 5. 79 -

Boehm int. Vol. 30 pge 75.

July 7. 1879 Experiments with belt
dynamometer Reg. Mac. battery in
field - Vol. 28. pge 163 -

Tested Res & Volts of 6 cord thread carb.
lamp Vol. 28 pge. 180 Nov: 3. 1879

Vol 29. pge 15 - speaks in English
provisional that I energize the fields by a
separate machine - get the english patent

Experiments on small dynamo with field in and out Vol 15 page 89.

One dynamo running field of the other with "old" resistance boxes in circuit probably about July 24, 1879.
Vol 1 pag 254, 255, 256 & 262.

The test on the Dynamo that Sawyer made Feby 13. 1879 Vol 14 page 165

Ground stopper with platina wires sealed in
Mch 20. 79 Vol. 22 pges 27 & 29.

Regulating field, Batchs writing shows Dynamo 2 fields & one adjustable resistance, no date, its bet Apr 3 & May 30, 1879
Vol 22 page 51

Plating ends Vol 57 pge 5

Holes in Wood Vol 27 pge 57.

Belt dynamometer Mch 2 1879
Vol 47 pges 165 & 167.

Copper carb Mch 4.80 Bk 70 near end

Contraction on pump Vol 85 pge 97.99

Plating carbons to clamp Dec 13.1880
Probably Horrick's writing Vol. 125 pge 149
and 163. — We probably commenced
plating in Oct 1880.

New Resist coils 2 feet high June 16 79
Vol 79 pge 50.

Transmitting power, supplying field of reg
machine Aug. 12.79 (probably same book)
pge 121 etc.

Resistance in field Vol 41 pgs 37. ~~p28~~
Nov or Dec. 1879.

Edgewise loop (Swan) made Jany 25-1880 Vol. 70. pge 37.
Banknote paper Jany 23.80 Vol 70 p41

Plate carbon to clamp July 5. 1880
Vol 104 p 142.

Bank Note paper Jany. 80. Vol 41 pge 77

Copper plated carbon Feby 24. 1880 lamp 730 Vol 41 pge 141 - also lamp 805 pge 185 - also lamp 934 pge 239 -

Gramme on field June 16. 79. Vol 77. pgs 4. 5. 6 & 7 - again on pge 32. again pge 44 - From Notts index see No. 4. pgs 105 & 149 Feby 15. 1879

In re Interference - Edison vs Maxim vs Swan
Edison's Exhibit Q.

W. H. Kenyon
Notary Public

Test of Edison machine. plat 2.3.4.5.6.7
8.9 & 10 Values on field - Vol. 77 page 61.
see also page 74 - Speaks of 22.5 magnets
per h.p. page 151 July 1.79.
Vol 78 Gives page Dec. 27.79.

Brackett & Young's test April 3.1880

Carbon shapes - Maxim's Vol 57 page 41
Apr 7.80 - others on page 43.

Vol 67. Jany. 2.1880
No 189 - 173 hours. No 159 burned 480 hours
No 255 burned 294 hours - No 223 burned
262 hours - No 193 burned 376 hours
167 burned 15 hours

No 155	280
No 201	280
No 164	322
No 172	259

Rowlands test published Mch 80 (plating done prior to that. pbly Jany 1880. So Francis says=)

Plating ends of Carbons Vol 42 pg 69-71 Also caveat book page 131

Manila fibre .007 thick Mch. 80 Vol 57 pge 5

Hole through horseshoe. thickened part = extra piece paper each side of horseshoe — spoken of in caveat above mentioned pge 131. caveat book

Ground stopper lamp. Mch. 29-80 Vol 57 page 1-4-7-9-11. 13-15.

Motto's inidis see also Book No. 146. Also No. 22 p 29. Mch 20.79. No 26 p 65 Feby 20.79 No 80 p 97. Oct 2.79. No 20 p 1. Feby 24.79— No 57 p 83 + 87 Mch 30-80

Carbon- broad strip arch (Swan) Vol 51 page 27. April 6. 1880.

Plating- Rowlands here July- 1880.
Francis did the plating so he could see it had been some time previous

Carbon spirals Oct. 19 1879 Vol 85 p 169

Herald Article Decr 21. 1879 All carbonized loops.

Paper lamp Oct 22. 79 Vol 85 p 177

Magazine lamp Jany. 6. 1879 Vol 3 p 49.

Dynamo  Feby 13. 1879.
Sealing wires in Feby 3. 1879.

Edison's Exhibit OR
Dec 15, 1883
W.H.C.
Notary

Stopper sealed wires Mch 79.
Vol 22. p 27 & 29.

Regulator (Sunflower) Vol 22, p 51

Shop lamp expt Vol 13., p 95-97 & 99.

Regulate current by moving the brushes. Experimental research Vol 5 page 102. No. 11. page 86. Feby 20. 79.

Carbons. of paper, Vulcanized fibre fibre etc. caveat Oct 28. 1879

Plating paper ends. Exp Research Vol 5 page 131.

Plate or disc Armature car
Mott Index

Book 56 p 205. Feby 15. 80. p 240 Mch 26. 80. p 187 Jany 31. 80. No 13 pge 129. Feby 1879. No 41² p 177 Feby 80 p 209 Feby 9. 80. Mott Journal Mch 15. 80 No 13 p 135 Feby 27. 79. Order Book No. 1. pge 207. Jan 2. 80.

Arctic Dynamo. Order Book No 1. p. 231. May 20. 79. Shipped to Leggett & Co. N.Y.

Melting metals between carbon points. Experimental Research. Vol. 1.

1° – 100 – 18 may. to 31. 12 days

2 100 . 1 June " 9 June 9 days

3 . 100 . " . 18 " 9 days

4 – 100 – June.18 – " 1° July 13 days

5 – 80 – " 14 " 9 "

---

480 Bottles of days

~~475~~

42

7 / 6

Menlo Park Notebook #134 [N-80-08-09]

This notebook covers the periods August 1880 and October 1884. The first part is by Alfred Haid and contains analyses of ore samples sent to the laboratory in 1880. The second part was used by Edison in 1884 to record notes and drawings of the telephone. Parts of the book also appear to have been used by Edison's daughter, Marion, for drawing, writing, and math exercises. The label on the front cover is marked "Mr. T. A. Edison." The book contains 280 numbered pages.

Pages not filmed: 60-66, 75-115, 118-124, 127-135, 138-139, 142-172, 177-182, 185-217, 220-258, 261-270, 279.

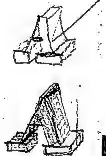
Missing page numbers: 45-46, 67-74, 125-126, 173-176, 183-184, 259-260, 271-278.

August 9th 1880

1) Silas Draper Rock Port
Jackson Co. Oregon.
letter with enclosed 3 little
fragments of ore, about
Nothing

13

13



Nov. 3. Green Paperbox cont.
letter and about 1 lb. quartz
Button 0.9 Z { 0.3 Gold 0.3
0.6 Silver.

August 9th 1880

1.) Silas Draper Rock Port
Jackson Co. Oregon.
letter with enclosed 3 little
fragments of ore, about 5 grams
altogether
Nothing

letter Vancouver Barracks W. T.
2.) A. S. Greene Headquarters
Department of Columbia July 27th
3 lbs. black sand. also a little
box contg. a few fragments of ore
about ½ gramme in weight
Black sand 1 oz. button { 0.45 Gold
0.55 Silver.

L. Simonds, Alford, Berkshire Co.
Mass.
Nov. 3. Green paper box contg.
letter and about 1 lb. quartz & pyrites
Button 0.9 oz { 0.3 Gold 0.3
0.6 Silver.

Nov. 4. A. C. Eddy
no letter. Theresa N. Y.
Paperbox with abt. 2 pounds minerals. The 5 specimens
letter came. contain only traces
No good for us. gold

Nov. 5. 16. Aug. 1880

A. H. Hovey 37 East 55th St.
N. Y. city

Copper ore { In 50 grains ore
3.720 Cu = 7.44 0/0

Nov. 6. Henry Zeltner, Brewer
Morrisania N. Y.
Sedimental ore No letter, he
Gold ??? was here himself.
Button 4/5 oz.
0.3 oz Gold
0.5 " Silver.

7) Parry & Dickinson, Assayers
Garfield, Chaffee Co Colorado
letter and two small paperboxes,
both of them containing the same
specimen of rock, which they
suppose to carry it. Nothing

8) J. F. Justice, Azusa
Los Angeles Co. California
Letter and one small piece of
rock, that the assayers cannot
agree upon;
1 oz silver and traces gold
cannot be worked.

9) J. W. Rayburn. Corvallis?
Oregon.
No letter. Large tinbox with ores
Only traces of Gold;
as the rock is very hard it
cannot be worked

10.) T. A. Bonnel 48 [illegible] Newark N. J.
Letter & package cty. 3 specimens of black Sand. Magnetic
. A. 1.00 button 0.4 Gold 0.6 Silver
. B. 0.7 button 0.2 Gold 0.5 Silver.
C. 0.8 button. 0.6 Silver 0.2 Gold

---

11) No letter G. H. Bonnatt, Fort Bowie Idaho.
Quartz with Pyrites
0.2 oz Gold, little silver.

---

12) John C. Anderson, Eagle rock Idaho.
Letter and little tin box cont. some pieces of granite rock.
Asks if Platinum
No Pt but 0.1 oz Gold.

John Anderson, Eagle Rock Idaho.
Black sand, magnetic.
0.2 oz Gold per ton
Good for us.

Dr. B. C. Dyer Bodie Mono Co. California. looks like quartz mill tgs.
2 bags tailings. I & II
I nothing but traces of Gold
II 0.15 oz Gold per ton

De Castro, 54 Williams st. N. Y.
1 bag ~~tailings~~ common sand (95 lbs,
Very poor; about one dollar.

C. D. Dobbins, Room 29
Trinity building, 111 Bway N. Y.
Tailings from the Hathaway Hydraulic Mining Co. Nevada Co. California.
These tailings are pebbles and gray sand
Nothing of it magnetic
2 oz. Gold per ton. Will test it for Tes

John F. Haynie Cabot
Arkansas
Letter and 1 lb. of Sand marked #6
Yellow Sand, contg. little Mika.
Not magnetic. Only traces Gold.

Guy H. Gardner. 14 South William St.
N.Y.
2 bags of tailings with Letter.
only traces of Golds

Naomi P. Tadd, Forest city
Min.
2 little bags of stone I & II.
Nothing.

J. M. Longyear, Marquette L.S. Michigan
"Quartzite" as he says: but it is
not. Poor stuff 2 oz. Silver.

C. S. Lane, Bonanza Bar
Cassia Co. I.T.
Black Sand. Magnetic
Nothing

J. H. Moore Northville N.Y.
Rock contg. Pyrites.
Only traces of Golds.

Ira F. Crowell, 438 Pine St.
Providence, Rh. Island
Black Magnetic Sands
1/10 - 1/15 oz. Gold.
Easy to concentrate it.
Good for E. Process.

James Demereau, Custer city
Dakota T.
Ore which the local assayer
pretend to contain Tin and
Platinum. Nothing

John Bingham, Conklingville
Saratoga Co. N.Y.
3 Specimens of minerals
Nothing.

William Manning,
North Cannonville Oregon
Black Sand. Asks for
Platinum
Nothing.

W. J. Danner, Burlington
Iowa.
Grey Quartz: Asks for Pt.
No Platinum, Only traces
of Gold.

Mahlon Cleaver
Crawfordsville, Mont. Co.
Indiana.
Sand conty. glittering particles.
They are Sulphurets
Nothing of any value.

L. A. Cole, Northville N.Y.
Piece of rock.
Only small traces of Gold.
Cannot be worked.

Seems to be good

S. P. Buell, Brisman Boulder Co.
Colorado.
Soft rock with Pyrites.
7 oz. Silver } per ton No Pt.
1/2 oz. Gold }

C. W. Ayres Tombstone A.T.

Lot of small specimens, every one of them is rich in Copper, some contg. considerably Ag. some also little Gold. If all these specimens are taken from the same locality, or from localities close together the region must be very rich, and worth while to be investigated [illegible]

Capt. C. A. Hogan
Castle rock Wash. Ter.
Infusorienerde

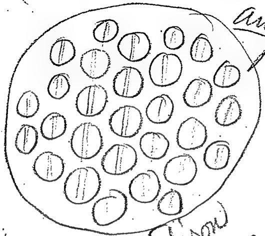
Barron Markham & Co.
Sidney N. S. W.
Superficial rock.

Junction City Oregon
John S. George.
Slightly magnetic Sand and piece of rock.
I think it is salted as the rock only contains traces Gold, while the Sand yields $87.00 p ton.
The white powder is Quartz sand
The metal is no metal but a worthless sulphuret.

George W. Parish
Pleasant Grove, Yakima Co.
Washingt. Terr.
Traces of Silver & No Gold.

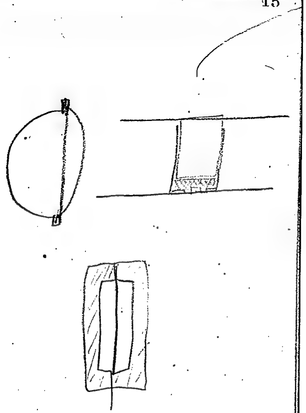
Gus Knight, San Bernardino
California. Yellow Sand
Nothing but traces gold

Dot Edison

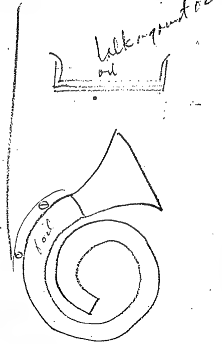


angel

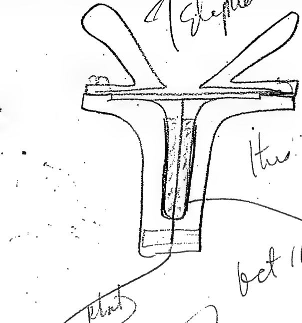
Miss Marion Edison
Sweetest of all



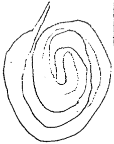
Telephone
Oct 10 1884
TAE

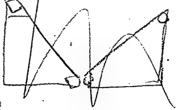


Telephone

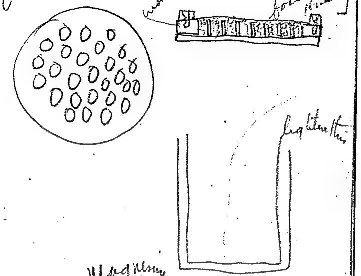


Oct 10 1884
TAE

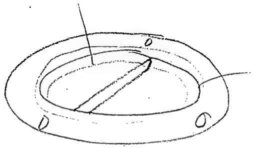




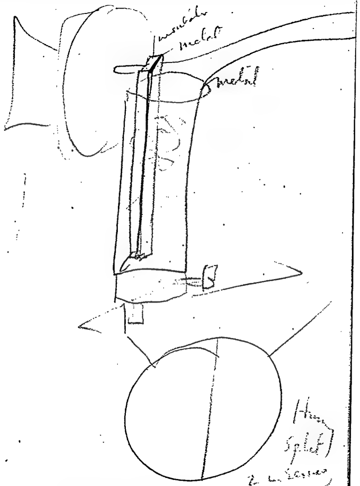
Telephone Oct 10 1884



free Magnesia
place Carbon
Cut ribbon & Sieve

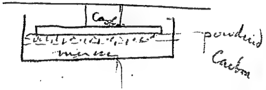


foil over 2 in Series

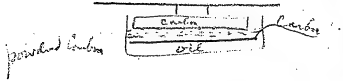


Hemi Split
2 in Series

Telephone Oct 25 1884
TAE

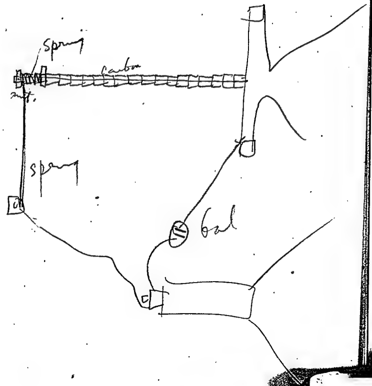


also oil

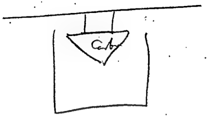


Telephone Oct 24 1884

Try Square diaphragm
in all the telephone Experiments



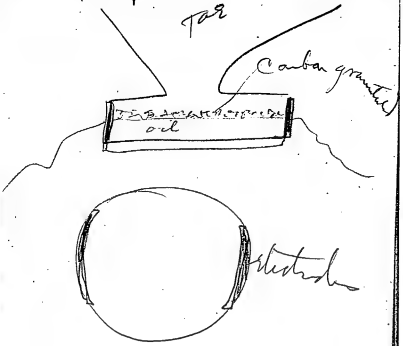
Telephone Oct 24 1884 TAE



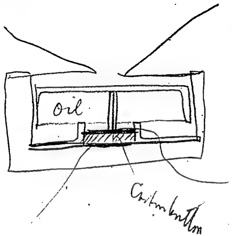
Try following - Galena - Calcopyrite, phosphide Iron, Conducting Sulphides peroxide Manganese art & native selected, = peroxide Lead Peroxide Silver - Silicon -

Telephone Oct 24 1884

TAE



Telephone Oct 24 1884
TAE



Telephone Oct 24, 1904
TAE

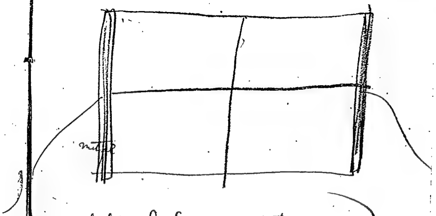
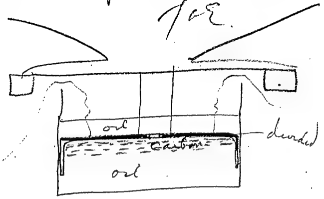


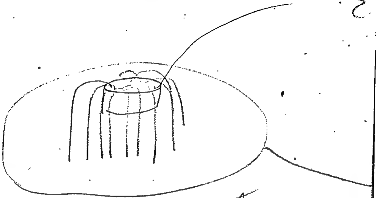
plate which is insulator covered with granulated Carbon held on by adhesive mixture. talk to this square plate --

Telephone Oct 24 1884
TAE

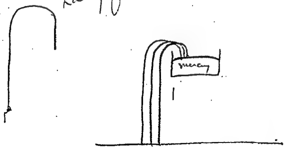


grind up conducting Lampblack with oil etc see if can make a conducting contact transmitting liquid —

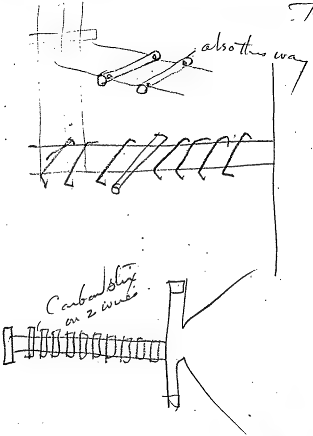
Telephone Oct 24 1884



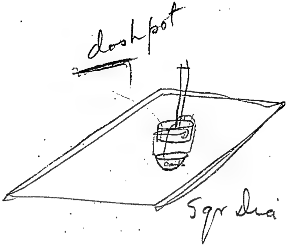
Lamp filaments

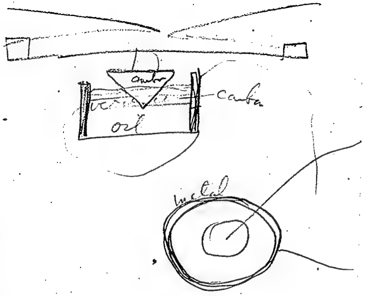


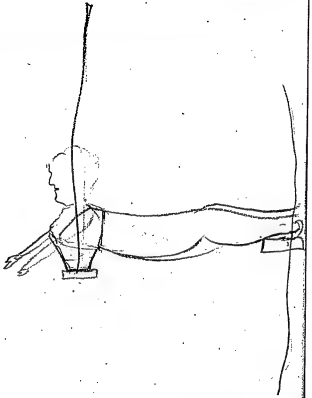
Telephone Oct 24 1884
TAE



Telephone Oct 24 1884
TAE




amber
oil
metal



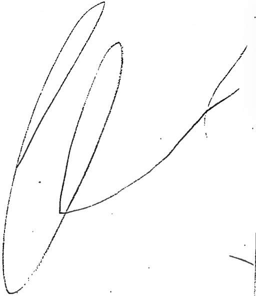
Feay

Send to Lamp factory for some Carbonized Cotton.

Mix anthracite Carbon with Rubber - also with Copal softened with boiling Linseed

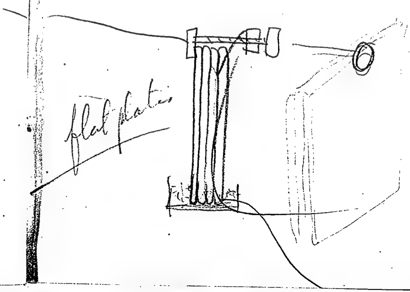
Try that mixture of plaster Paris & Carbon

Try Lampblack & granulated anthracite Carbon with mineral oil - good



Telephone Oct 24 1884
JAE

got .40 primary + 100 to 300
Secondary Coil wound by
Mayer to give 1/4 @ 1/2 inch
Spark try this a gainst
Regular - think talking be
clearer -

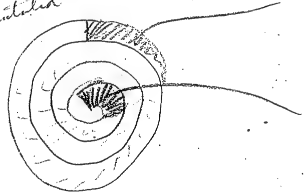


Telephone Oct 24 1884

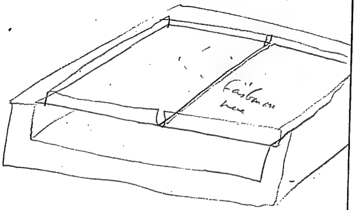
TAE

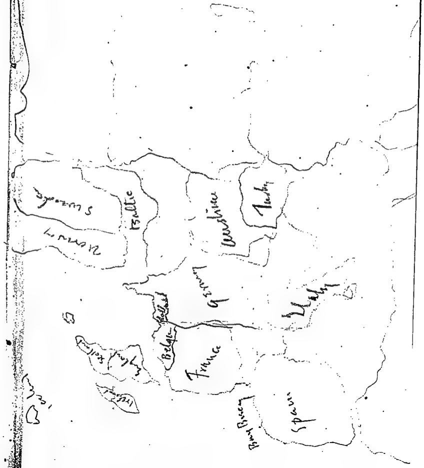
Carbonize some cloth at Lamp factory various kinds for telephone Electrodes =

Granulated Carbon



Telephone Oct 24 1884
TAE

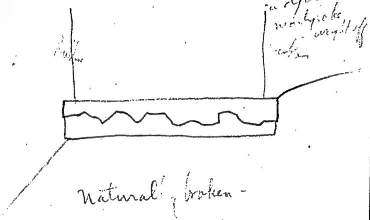


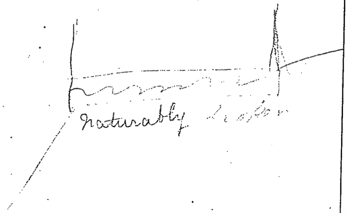

Baltic
France
Spain

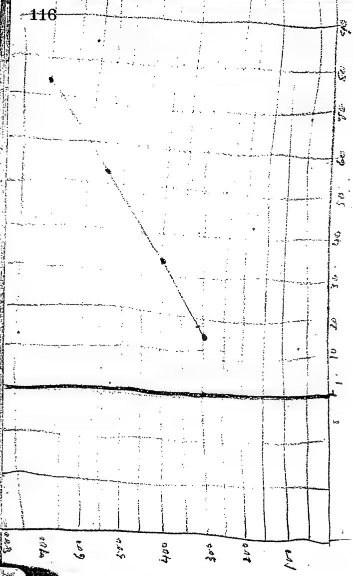
73
14
02
73
04
[illegible]
17
64
42
4[illegible]
49
44
63
40
08

70
64
48
40
44
44
54
52

Telephone, Oct 24 1884





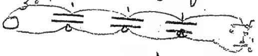


4 Condensers

100 000

6000.	870
12000	435
24000	217
48000	108
96000	54 –
192000	27
384000	13 mf –

$3\overline{)54}$
18



Railroad

Railway

Railroad

Railway Railway

Railroad

Railroad

Line

Table T T T
Each
Table Table
Table
Two suits - a piece for Tom -
& Millie. Table Table
Stockings. Table
Dark waists
Two pair of shoes, for each
two pairs of rubbers.
Hats two each
Ties dark ones.
Lisle thread gloves.
[illegible]
Some [illegible].

2
2
2
Yours T
25 26 28 29 30 31 38 39 20 26

Wm Orton

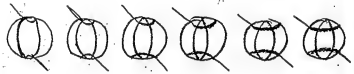
Wabash

Valley

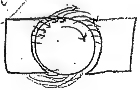
Wabash Valley

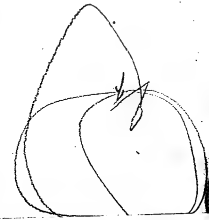
Valley

R Royalty



Wm Orton





Menlo Park Notebook #135 [N-80-07-30]

This notebook covers the period July-August 1880. It was used by Edison to record notes and drawings relating to lamps, dynamos, meters, voltage regulators, and the electric railroad. There are also notes on electric railroad patents issued to other inventors. The label on the front cover is marked "Private Patent Book" and "T A Edison." The book contains 276 numbered pages.

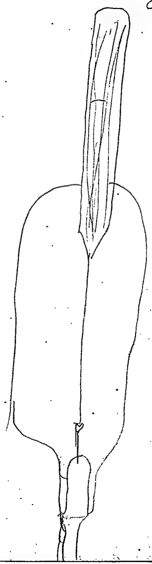
Blank pages not filmed: 20-51, 78-276.

Missing page numbers: 75-76.

July 30 1880 —

TAE
[illegible]

Self feeding Lamp
Incandescence.



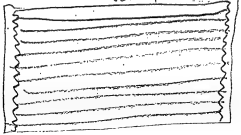
Want to claim Mica as seperator in Commutator =

Show full working drawings of Commutator =

~~Prepare Rowlands patent,~~

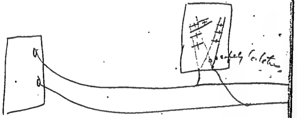
Carbon clamps - H Combzd

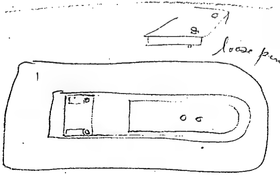
Carbonized as a whole after bending then break off =



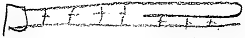
July 31. 1880
TAE
Chas Batchelor

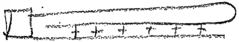
Berlin Porcelain ware for flasks - say same as Combustion tubes = for Carbonizing:

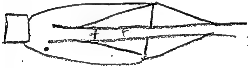


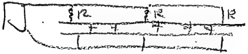


loose pin —





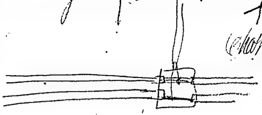


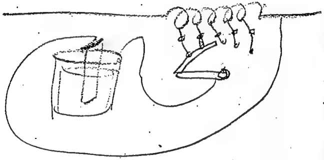


July 31 1880

TAE

Chas Batchelor





adjustable Meter

Twenty

Francisco

Francisco

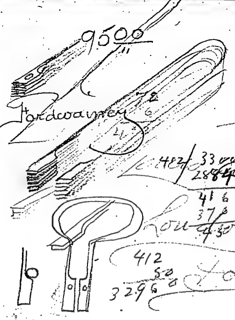
Francisco San Francd

Francisco

San Francisco

9500

July 31 1880



412 | 33000 | 80
2884
4160
3738
432

412
50
3296

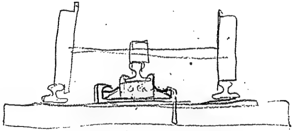
Forgaille

Electric R.R. Aug 3. 1880

TAE

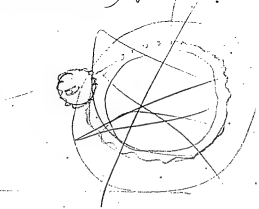
Paint the whole of the Rail with an insulating paint (all except top) -

this for street RRs painted under a.

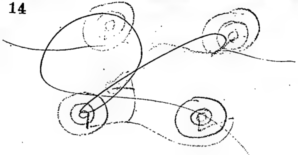


put this in

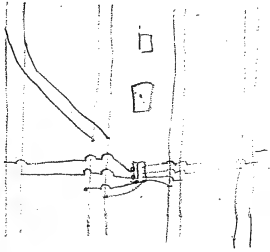
Aug 3. 1880



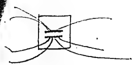
pat this =



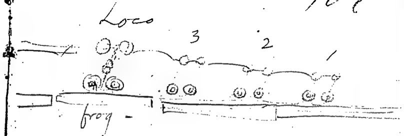
Aug 3 1880
TAE



Patent this,



Aug 3 1880
TAE



patent,

In Reversing mechanism Can
Reverse field & magnet
Motion of rod also be shown
[illegible]

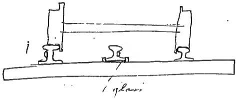
Mention, that train can be braked by opening ckt to Bobbin & short ckg it ~~also that in~~ or it may be reversed while in circuit thus acting as a brake, or its current. (12) Current due to the rotation of the bobbin by the train after disconnection with the track may be thrown through the brake magnets on the Cars =

Aug 3rd 1880
TAE

~~Patent~~

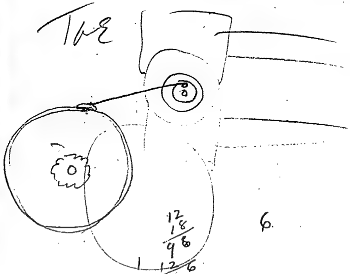
Show Hornig's new design

Aug 3 1880
TAE



Aug. 5. T. A. Edison

TpE



12
18
48
126
21

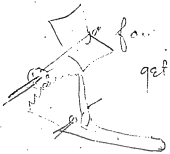
6.

8

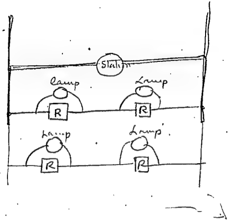
9.

18.

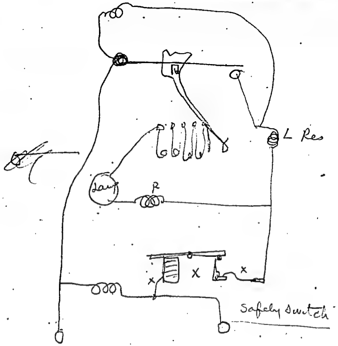
Means for getting a slow movement to mechanism.



Constructs Rheostats of ribbon to Expose great surface prevent heating find reference =



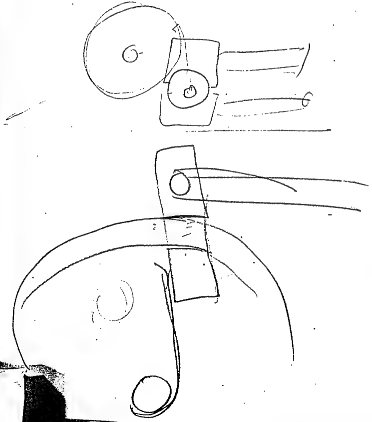
States that fracturing carbon due to sudden changes temperature Sudden heating disrupts - This due to Nitrogen gas absorbed by Carbon suddenly Expanding by heat —



abnormal flow Current causes
attraction magnet & opening of
magnet circuit - X. found in
Chauffeur under head Lighting
arresters, O.V.E.

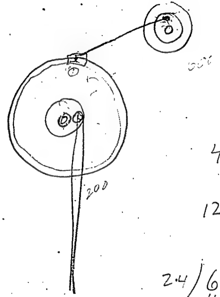
over speaks of interposing in conductor a section of Conductor more readily fused) than the Conductor constituting the rest of the circuit so that when there is ~~too~~ much Current it will instantly melt & destroy Continuity of the circuit.

Say that current through Lamp begins to heat Carbon which rapidly acquires resistance + the resistance of the Carbon increases in proportion to the movement of the lever D over the ~~contact~~ points M until all the 5 Res O of 2 ohms each have been cut out of circuit. he infers that just as you cut out R that the carbon increases its R - hence the changes does not effect the total Res



60

300
60
18000



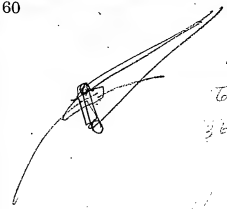
500

4 24.

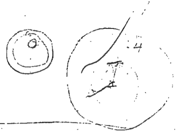
12.

24)600(25.
48
120
120

4



12
50
600
60 60
3600 0



12/ 600 (50
60

6.

12
50

12
50
600

60

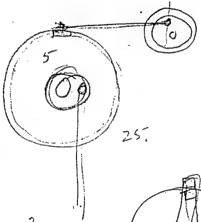
6

12

15
50
750
60
45000

9.

6.



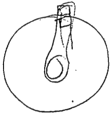
5

600

6 foot + 3 foot
6 do tee

25.

3



6.

18.

6

9

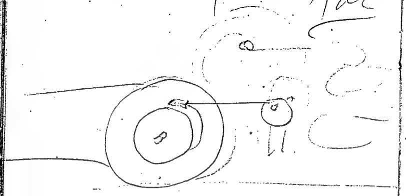
300.

20

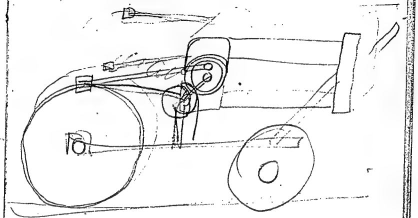
10.

10

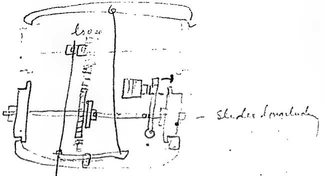
Aug 3 1880
TAE



Aug 3 1880
TAE



Olmsteads E brake



61089 dates

Jany 8 1867

his patent 1869 - April 27 -

Pat 98880 ... 18 1870

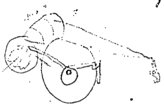
substitutes friction ratchet gears

also 1 89495 - Apl 20 - 69

nothing ... in addition

Tri[illegible] Brake

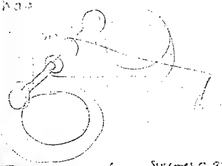
No 59 805
Nov 20 1866



claims nothing but clutch

has patent. 49 842
one Jany 15 1874 - 151 335.

Nos



when magnet [illegible] swings a [illegible] in on
shaft of car wheel that [illegible] chain winding

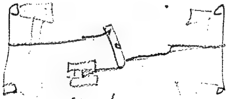
H S Daggett.
No 116 818, July 11 1871

lever brakes ~~tight~~ has
Chains on Extra wheel which
is rotated by a belt from
main axles but it cannot
wind-up chain as it (the belt)
slips but the axles is drawn
outwardly by a magnet thus
tightening the belt & the
shaft rotates & winds up the
chains —

Geo En-Earl 139557.
1873 =

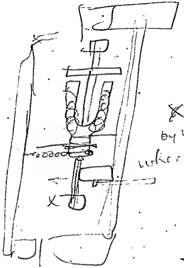
Electromagnet etc, Drain
axles do not magnet
[illegible]

P. V. Cinnamon 175935 April 11 1876



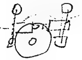
Whipple 22213. Nov 30 1858.

no spec



X. Shaft rotated
by main axles by wheel
wheel (may closed causes the
, rotation winds up
chain -

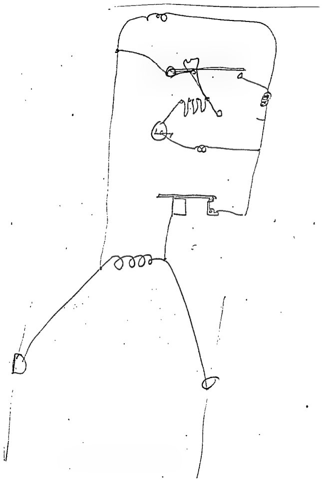
Carpenter 19 Jan 1858.



[illegible]

2240
6
13440
5.00
139.40

[ITEM FOUND IN BOOK]



Menlo Park Notebook #136 [N-80-08-11] (NOT FILMED)

This notebook covers the period August-October 1880. Most of the entries are by Charles P. Mott. There are also a few entries by Charles Batchelor. The book was used to record land owned by George Goodyear at Menlo Park. The label on the front cover is marked "Lands," "Lots," and "C. P. Mott." The book contains 284 numbered pages. Approximately one-third of the pages have been used.

Menlo Park Notebook #137 [N-80-07-16]

This notebook covers the period July-December 1880. The entries are by Francis Upton and Francis Jehl. Some entries are probably by William Hammer. The book contains calculations and notes regarding insulation for underground cables and the electric railroad. The label on the front cover is marked "Lines Insulat" There are 284 numbered pages.

Blank pages not filmed: 88-91, 140-143, 146-149, 152-253, 262-267.

Missing page numbers: 111-114, 271-272.

Conducting wire to lines
12.3 Ohms

to RR 9 Ohms

In bridge German silver
box with string on it balanced
by Box No. 2 6300+1600+400
[illegible] in $\frac{1}{1000}$ other side
of bridge

123
2)260
180

Harry [illegible]

138 Rd
27 Chms,
320 Bd,

July 16 1880

wet day

		To ground	
18 wire circuit	55	25.	43.
Carmen Circuit	1.4	4.2	8.2
	2800	2900	2100.
6 wire circuit	61.8	25.6	50.5
Edison's line	1.6	5.8	9.4

The weather Dc Book 103
page 155

In the afternoon
Carmens circuit again
tested $\frac{2850}{1425}$
P.M. $\frac{120}{1.65}$ Ohms

Dry day

P.M 2900 to ground

The kenite wire leading to the lamp-posts dug up and left in the air to dry.

Monday — Yesterday was a dry hot day Nearly all the kenite wires leading to the lamp posts have been exposed to the air so that they have no connection with the ground

July 19
8-30 a.m.

$$\frac{2820}{}$$

1 4.1 0
6 3

7.7 Ohms to ground

a bucket of tar tried and its resistance found to be extremely high could not easily measure

Line 12 M

$$\frac{2650}{}$$

1 3 2.5
.6 3

6.9 5 Ohms

Insulation, Carman's Circuit, July 19/80

All Kerite lamp wires, where exposed to earth, are being overlaid with rubber tape ("piping") and served with coal tar, then left exposed to the sun to harden, ✳

July 19 2 P.M.

2900

14.5
6.3

8.2 Ohms

Those lines cut off that were tacked to the boards and the resistance to the ground

3900

or 13.2 Ohms

Other line 4200 Ohms

14.7

15900 Ohms between lines

29.5

12.6

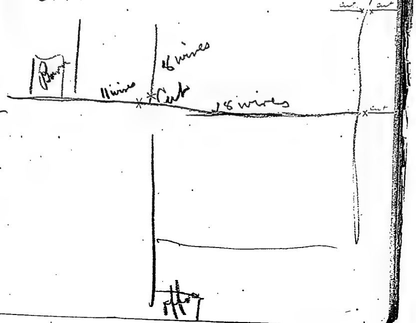
16.9 Ohms between the lines

About 2500 feet of the circuit left.

6290
2000
8290
41,45
6.3
35,15 ohms to ground

36.65

The lines cut at the corner



after rain

(3800

19.3
6.3
12.7 Ohms

July 20
Test R.R.

Insulation both wires leading to track to ground

6290
4
25160
6256
6250
12000
7000
56660
283.3 Ohms to ground

Leading wires
1800
9.0 Ohms
2800
14.00
9
5. Ohms between tracks

22

93 6

5) 425,020

425 900

R. R

(1850
925
4.5
575

170 4.5 7.5

(1200
600
45
1.5 O has bothe
sides to grammed

100) 21,29600

21,296
20
425,920

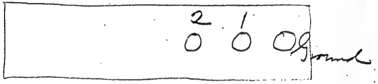
42.

33280	4.5220
70	1.8451
comp 63 am	6.2007
	2.5678

370 Ohms

B R

The ~~track~~ disconnected just beyond the ~~place~~ post which has been insulated.



On ~~Tr~~ to ground

$$\frac{70}{6300}$$

6250
6250
6290
6290
8200

33280

6250
11
73

41280 4.6158
70 1.84571
comp 1500 6.8239
3.2848

1920

1630 3.2122
70 1.8451
1500 6.8239
1.8812

76.1

R, R

No. 1 to ground

$\frac{70}{1500}$

6250
6250
6250
6250
6290
6290
2700
41280

Paper to No 1

$\frac{70}{1500}$ 1630 Ohms

$\frac{1}{200}$

6290
6290
1930
14510
72.5

R1 R

No 2 to tarred ~~paper~~ ties

$\frac{1}{200}$	6290
	780
	7070
	35.35
$\frac{70}{3200}$	6520

Result

* Paper 75 Ohms

Tar 38 Ohms

Three ties with no paper

R. R.

6290
9600

200) 15.8.90

79.

Cars off track

6290
6290
6250
6000

) 24830

124.1 5 Ohms to ground from paper side.

R. R
San side

6290
6290
6250
3600

224.30
112. Ohms

100 feet 50 Ohms

6290
6290
4500

17080
8514 Ohm

112
8514

26.0

R. R. between rails

Been raining all night

$$\frac{34.50}{17.25}$$

5 Volts.

$$\frac{17.25 - 9}{8.25}$$ Ohms

Positive

Placed 2 hours ago - everything moist —

Reversed Current to Negative

R. Same

---

20 Volts =

Res - [illegible]

[illegible] —

---

26 Volts

Res - 1/10 [illegible] higher R

July 22 1880

Everything very wet

July 22 1880

18 wire circuit

Between wires

6920
2100
(9020
45.1
19.6
~~36~~ Ohms
32.8 = 32.5 Ohms

One side to ground

(6290
31.45
76.3
25.15 ohms

Other side

(4400
22
6.3
15.7 Ohms

July 22 1880

Line 6 wires laid in tarred boxes to Cedar Street. To Ground

15700	7600
28.5	38
6.3	6.3
22.2	31.7

6290	~~6290~~
6600	~~6100~~
12890	~~12390~~
64.	~~61.9~~
12.6	~~1~~
51.4	

July 22 1880.

Carmen circuit 25 wires
Between wires

6250
7150
13400

67.
12.6
54.4

To ground

6290
7000
13290
66.45
6.3
60.15

6290
6100
12390
61.9
6.3
55.6

R, R, July 22, 80

8000
6300
1700

Between tracks) 13 Volts

6290
6290
700
13280
9.
4.2

6290
6290
1300
13880
9
4.8 Ohms

33 Volts the same

31.1

6250
2
12500
6290
6290
5000
30.080

Balanced

R. R. between tracks

July 23 1880
rained nearly all night
no sun

6290
6290
500

130.80

13,080 Ohms
9.0

4. 0 Ohms
4. Ohms between tracks

One side to ground

6290
1200

7490
4.5

2.99 Ohms

It is proposed to insulate one side only of the conductors and to leave the other uncovered. Test insulation one side only

R. R. July 24 9. A.M.

Resistance between the lines 200 (2700
13.5
9
4.5 Ohms between the tracks. Yesterday and last night were without rain ~~and~~ though the sun has not shown enough to dry the sleepers. I could not find any ground on our side

Cirmens circuit

6290
6290 boxes of ground
6250
6290 One side
6290
1400

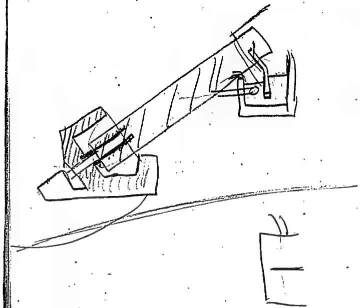
$\overline{32720}$ (1)

163 Ohms

6250
6250
6290 side
6290
1000

$\overline{20080}$ (.2)

130.4 Ohms



A wire wrapped about one of the conductors and buried about six inches in moist earth

6290
6290
6250
~~6400~~ 5400
(24236
1.21

(2)

(1) 6290
6290
9400
(21980
1.09.4 Ohms

Carmeus line

dry day - fresh covered ~~with~~ cloth and ~~tarred~~

6250
6290
6290
7700

26530 Ohms.

1.8549
1.8549
11646(4)
8.0610

3.4172

2620

4.5155
3.4172

1.1013

12.15 per H. P.

1324

Best in oil
Copied

6250
6250
6290
6290
2000

27080
1354.0 Ohms Cold.

16 candles

6290
6290
4800

17380
86.9

21.5 = A
71.6

1.9206
1.9206
1.6464
8.0888
3.5764 3760
4.5185
.9421 8.75 per H.P.

1324
Bast in oil short
time Copied

3-2 48 candles

6290
6290
3720
16300
81.5

250 = D
83.3 Volts

$$\mathcal{E} = \frac{\mathcal{E}}{R}$$

$$C' = \frac{\mathcal{E}}{R+r}$$

$$\cancel{R = \frac{\mathcal{E}}{C} = }$$

$$\cancel{R+r = \frac{\mathcal{E}}{C'}}$$

$$\cancel{R} = \frac{\mathcal{E}}{C}$$

$$\mathcal{E} = cR$$

$$c' = \frac{cR}{R+r} \quad R = \frac{rc'}{c-c'}$$

$$(R+r)c' = cR \quad R = 2r$$

$$Rc' - Rc = -rc' \quad rc \; c$$

$$Rc - Rc' = rc'$$

Galva on 25.8 Ohms in shunt 20 cells

285 275 560	560 552 1112	270 282 552	284 269

5000 Ohms in with galva

112 122 234	234 241 475	126 115 241	112

2000 Ohms with galva

187 173 360	360 365 725	175 190 365

$r = 5000$

$C = 1112$

$C' = 475$

$C - c' = 637$

$$\begin{array}{r} \cancel{1112} \\ \cancel{5000} \\ \hline \cancel{5560000} \end{array}$$

$$R = \frac{r\,C'}{C - C'}$$

$$\begin{array}{r} \cancel{6.7451} \\ \cancel{2.8041} \\ \hline \cancel{3.9410} \end{array}$$

~~8730 Ohms~~

$$\begin{array}{r} 475 \\ 5000 \\ \hline 2375000. \end{array}$$

$$R = \begin{array}{r} 6.3756 \\ 2.8041 \\ \hline 3.5715 \end{array}$$

3730

r = 2000

c = 1112

c' = 725

c - c' = 387

~~2224000~~ ~~6.3472~~
2.5877
~~3.7595~~

~~5750 Ohms~~

725
~~2000~~
1450000 6.1614
2.5877
3.5737

3740 Ohms
3730 Ohms

Resistance high resistance
galva 3735 Ohms

~~One cell through~~

20 cells on rails ~~and~~
20 feet long
~~20~~ 19 sleepers laid on
wet ground

Hot sun all day

3 P.M July 29, 1880

Resistance

8.900 Ohms 20 cells
of battery.

The weeds pulled from under
the rail which touched it
and the resistance

8.950 Ohms

13 spikes out
resistance
12.300 Ohms

The sleepers were allowed
to drop in some places

Ran up to 75000 — 100000 Ohms

blocked each end so
that rail rested on
Two sleepers

290.000 Ohms
standing on rails two men
220,000

25

.16

Three sleepers

250,000 Ohms

5280
4
211 rails per mile
19 sleepers per rail
1899
211
4009 sleeper per mile

4000) 400000
100 Ohms per mile

Both sides raised resting on two sleepers

Result There is no certainty in testing ~~on~~ dry rails and sleepers
Method make as good insulation as is ~~sander~~ wished to be tested then wet every thing and test.

1,600,000 Ohms
from rail on sleeper to good ground

Wet rail laying on the grass to ground
450 Ohms

Rail wet ~~under~~ on 2 sleepers to rail on grass
240.000
After some minutes
~~7~~8.000

July 29
Carman's line

Wound all the length
but about 300 ft on each cable
and nearly all tarred

750 Ohms

July 31 1880 8-30 A.M.

Carman's line all wound
with cloth and nearly
all tarred.

1400 Ohms
to ground each side
4000 Ohms
4000

July 31, 1880. 8-30 A.M.

Six wire circuit. Boxes with exception of crossings exposed to the air.

R = 150 Ohm

Aug. 2, 1880. A.M.

Cannens circuit between the wires 3400 Ohms

9.4 Ohms in box placed at end of wires leading from box.

Line and wire

~~22.8 Ohms~~

22.8 Ohms

Line alone 13.3

Spool 9.5

22.8
13.3
9.5 Ohms

Cammen circuit

again 3000 Ohms between
the wires

About 3000 Ohms to ground
but continually altering as
the wire was moved by
those working on it.

Aug 3 P.M.
After heavy rain for
an hour and a half
1430 Ohms
About 700 Ohms per mile
Morning 900
To ground 700 - 700

$$20 \,)\, 5280$$
264 rails to mile

4250	3.6284
264	2.4216
	1.2068

16 Ohms per mile

3 1/5 Ohms per five miles

R. R. Short track

Tarred paper under the rails dry 120,000 Ohms

wet 7,000 Ohms

4:30 6.200

Later in the afternoon ~~at~~ continually rising

Aug 3 After heavy rain for an hour

4250 Ohms

Aug 4 Rain during night very wet

2800 Ohms

~~cartridges 25 and 18 wire~~ [illegible]

Aug. 1~~4~~ 10. a.m.
25. cable + 18. cable.
3,000 ohms bet. wires
12.00. + 1650. ground

~~[illegible] 1085 [illegible]~~

12 feet rubber cloth 2" wide
weighs 790 grains
7000 grains make 1 lbs

$$.790\overline{)7000}(.88$$
$$\underline{632}$$
$$680$$

$$\begin{array}{r} 8.8 \\ \underline{12} \\ 176 \\ \underline{88} \\ 105.6 \end{array}$$ feet per lb#

50 cts. per lb. estimated cost

That is about
1/2 ct per foot

Clear Rubber Tape wound on spindle $\frac{21}{32}$ in. in diameter, 1 ft. long so wound as to be double thick the entire length.

Then unwound tape weighed 160.2 gr

" " " measured 56.25 inch

$$437.5 \,)\, 160.2000 \,(\, .34$$ ~~grains~~ oz. per foot of cable $\frac{21}{32}$ in. dia.

$$\begin{array}{r} 160.2000 \\ \underline{141.25} \\ 18.950 \\ \underline{18.500} \\ .450 \end{array}$$

100 ft. of same cable would take 34 oz. or 2 lbs. 2 oz. which @ 60 ¢ per lb. = $1.28 ¢

Marline wound on spindle same
as on cable.

$$\begin{array}{rl} 2.5 & \text{in to each turn} \\ \underline{7.} & \text{turns to in. of cable} \\ 17.5 & \\ \underline{12.} & \text{in to foot.} \\ 210.0 & \text{inches of marline} \end{array}$$

on each foot of cable same size.

Marline unwound and found to measure 201.5 inches.

Marline found to weigh 648.4 grains per foot on cable $\frac{21}{32}$ in. in diameter.

Marline costs 13.4 ¢ per lb. add freight and 16 ¢ add freight.

To each foot add ½ ¢ for winding on cable.

Aug. 23rd 1880.

Carman's Circuit. 25. 18. 11. and Turnpike sections in, all others out.

Between wires 15. ohms
Ground. 37. ohms. both sides.

Aug 30 1880

25. 18 turnpike sections
between wires 42.9. Ground
22.9 + 27.9 after the rain which
this was after the rain which
which was yesterday & today.

Aug 31 1880

Fused cable $5000 for 3 layers
Rubber 275 — 2 layers rubber

$\frac{50000}{1000}$

R
R
S
Def

September 1 1870

Tests on the wire in the barrells. (1)

no 1
Defl 186 Res 84 ohms (2)

~~2~~
~~3~~ Defl 2~~1~~5 = 120 ohms

(3)
Res 4850 ohms, for 3 layers

Res 54 ohms layers Rubber (4)

$$\frac{100x}{100+x} = 100$$

1st New - 250 - 252½.	502½	
2nd Set. - 251 - 254.	505	
3rd Set. - 220 - 223.	443	new - $\left\{\begin{matrix}250\\253\end{matrix}\right. = 503$
4th Set. 252 - 254½	506½	
5th Set. 251½ - 254	505½	

W. J. H.

Aug 21 1880

Line tests (25 cable) 10

Left hand binding post tests with ground 632 ohms.

Right hand one 650.

Found a cross in one of the Camp posts (a dead cross) tested after this 2145 ohms.

Ground 1085 both

This is the 25 and 18 wire,

Section of Carmans circuit wrapped once with muslin tarred, wound with marlin covered with ~~twist coat~~ Tar boiled with crude coal tar, half & half

Aug 21 1880

Carmans Circuit.

25. 18. + 11. wire sections in ckt.

765. ohms.

Aug 26; After heavy thunder-storm of yesterday ground is well soaked.

Carmans Ckt. 25, + 18. wire sections in ckt.

Bet. wires 3,500 ohms

Ground. 1,250. + 1,435 ohms.

Carmans Ckt. 25. 18. 11. + Turnpike sections in ckt.

Bet. wire 73.6. ohms (aug. 26, 1880.)

Ground 37.7 + 37.5.

Carmans Ckt. 25. 18. + 11. wire sections in ckt.

Bet. wires. 330. ohms.

Ground. 230. + 227.

Aug 26. 1880.

$R^{0} = a$ $\quad c = \frac{1}{R}$ 1st line

$R' = b$ $\quad c' = \frac{1}{R'}$ 1st & 2nd line

$R'' = \cancel{c}$ $\quad c'' = \frac{1}{R''}$ 2nd line

$c' = c + c''$

Aug 27

turnpike road 76 ohms

Aug 28. 1880

[illegible] Turnpike

all side lines out except short one main line by Edison's [illegible] Turnpike.

Bk. ins 235. ohms.

Ground 131. & 83. ohms.

Aug 28. 1880.

Edison's Ckt. [illegible]

opp. office.

Bk. ins 13[illegible] ohms.

Aug 31 1880

Tested the wire covered by Howell with rubber cloth & tar. It was put in water, tested 120 ohms when plates was lowered down it went down to 77 ohms.

Bare wire tested also gave a Res of 100 ohms.

25 18 & Turnpike. 44 ohm
Ground ~~25~~ + ~~24~~

25 + 18 + 11.
Ground 67.5 + 65
Res of line 126.

1825 wires

Line R. 950 ohms
Ground 497 + 482

Edison line to box on Railroad 76 ohms. Ground 43. 32

Edison's line to box on corner of the office 247 ohms.
Ground 76 + 172

Sept 2 1880

Cable No 4 3 thickness muslin each tarred with boiled ~~coal~~ coal tar. Res 120

Cable with three layers of Rubber cloth and 3 layers of tar. 3200 ohms

September 3 1880

one length of 100 of Bare Cu wire submerged in water

Res 127 ohms

Cable No 1
One thickness Rubber tap (white) spirals overlapping about one third and tarred with stiff coal tar
Res 84 ohms. - Cause so low the iron plate was lower down than the other

Cable No 2
Three layers of Rubber cloth
3 layers of Tar

aug	Res
31	51.000
Sept 1	4850
2	3200
4	2680
6	1500
8	2400
13	1.910
14	2000
	2000
15	1800
16	
20	1000
21	1000

(No 3) Two Thickness of White Rubber cloth wound in opposite directions
Res 77 ohms

(4) 3 Thickness of cloth Tarred with boiled Coal Tar
Res 120 ohms.

No 5 two Thickness of Cloth each served with hot linseed oil.

Res Sept	Res
3	470
4	140
6	110

(No) 6 Cloth on Cable, with parrafin Rubber cloth (sep) cloth again with parrafin.

Sep	ohms
3	1200
4	171
6	120

(7) 3 Thickness cloth served with coal tar treated with quicklime.

Sept 4 120 ohms

(8.) Bare wire rubbed with dry hard parrafin Then rubber cloth black ~~too~~ Covered with ~~to~~ black rubber cement, then rubber cloth, Then cement, Then rubber cloth, smooth down with hard paper

Sept 4 12500, Then went down to 7000 Sept 21 210

Sept 6 130

Sept 9 210

Sept 17 210

X

$\frac{5000}{100} = X$

$\frac{1000,\ 5000}{8}$

$e\,\frac{\frac{g}{2}}{g+\frac{g}{2}}\quad \frac{\frac{2g}{2}}{2g+\frac{2g}{2}}$ els

e

$e\,\frac{\frac{2g}{2}}{g+\frac{g}{2}} = \frac{e\,g}{3g}$

$e\,\frac{\frac{eg}{2}}{g+\frac{g}{2}}\quad \frac{2eg}{2g+g}$

$\frac{10}{.5}\quad 2\quad \frac{101}{10}\quad \frac{19}{20}\,e$

$e\,\frac{\frac{g}{2}}{e+\frac{g}{2}}\quad e\,\frac{g}{2g+g}$

9 Bare wire rubbed with paraffine Rubber cloth then Cold and hot paraffine then rubber and paraffine and rubber cloth with more paraffine

Sept 4. 9000 went down in about an hour afterward to 3500

Sept 6 120 ohms
21 120 " "

10 Rubber cement on bare wire Rubber cloth, muslin, Compound 3# Rubber cloth, rubber cement, Rubber Cloth rubber cement, Dusted with chalk

Sept 7 299000
8 1400
9 500
10 450
21 150

11 Rubber ~~cloth~~ cement on bare wire Thick
'' cloth
muslin
Compound 1
Rubber cloth
'' cement
Cloth
Cement
Dusted with precipitated chalk
Sept 7 79000 ohms
21 170 ohms

12 Muslin on bare wire
Compound 2 #
muslin soaked in linseed oil
Compound 2 # Thinned cotton =
seed oil.
Muslin
Rubber cloth
'' cement
'' cloth
Sept 7 26000
Sept 8 8000
'' 9 740
'' 10 540
'' 13 300
'' 21 180

13 wire covered with marlin Then boiled in Compound #3 Then rubber cloth

14 7 (seven) strands wound with marlin

~~25 cablewire tests 23 550ohm~~

No 25 wire Cable tests 550, ohms
" 18 Cable tested 17, ohms,
There must be a dead cross.

" 17 Cable 200 ohms.

25 wire cable + Carmans line about 25 ohms.

15 Muslin
Refuse Compound
Muslin
Refuse Compound
Sept 13 Res 140 Ohms

16 White Rubber cloth 3 Layers
Boiled pine tar 2 Servings
Made to compare with
~~No~~ 2

Sep 13
176.000
14 85000
15 30,000
16 12500
21 1050

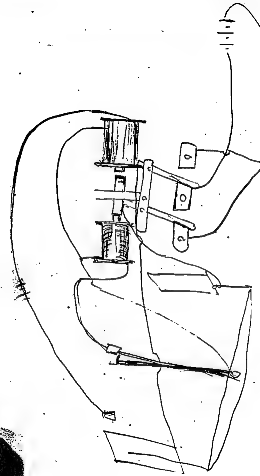
Test on Cable no 19

17 muslin, compound 4
muslin compound 4
muslin Boiled linseed oil

Sept 17 70 ohms

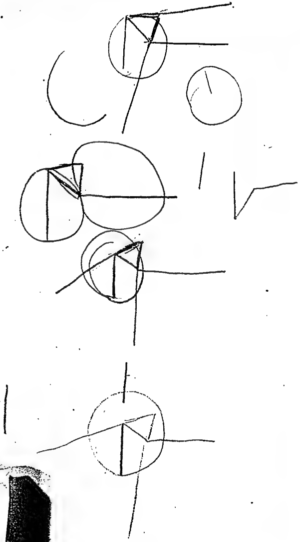
18 Three thickness of muslin
soaked in hot ~~linseed~~ pine
tar.

Sept 18 — 870 ohms.
" 27 70 ohms



19 Rubber cloth compound
7 Rubber cloth compound
Rubber cloth.

Sept 17 1.117.000 ohms.
Sept 20 116200 ohms
" 21 70000 ohms



20 Muslin
Compound #7
Muslin
Compound 7
Muslin

Sept 21 370 ohms

21 Muslin
Muslin soaked in Compound #7
160

Edison's Line. 1st. section.

Oct. 14th 1880.

Between wires 21,000. ohms.

Edisons Line. 1st & 2d. sections

Bet. wires 4,250. ohms.

Nov. 1. 1880.

Edisons ckt. to box on R. R. 560. ohms. to Davis's 400 ohms to end opp. lamp fcty. 160. ohms to end. back of Edisons Barn 260. ohms

Nov. 2d. 1880.

Carmen's ckt. from Dynamo room to Wm. & Thos. Carmen's house direct (side lines ve cut out) 675 ohms.

Same ckt. with only turnpike line in. 240. ohms.

Same ckt. from dynamo room to box at corner of boardwalk 800. ohms.

196 ohms — 22.1 for galvanometer

time to KK and branch line Con

insulation test—

178.9 for circuit line

196

Tests of insulations of wires on page 129
made. Oct. Nov. 6. 80. after two days soaking
rain, and still dripping.

—22— for ft per line
38 / Ohms insulation on
line from Dynamo Room to
Batcheler's corner 325
367. Kruesi line and direct line
199.8 By Stable

From dynamo room to corner opp. office
and line in front of Lab. 997 " "
995 With line Back of Dynamo in.
~~tools come or without~~

From dynamo room to box at
Cornish's, 76 : ohms.
From dynamo room to box at cor.
of board walk this side of Upton's
house, 500, ohms.
From dynamo room to Theo. Carman's
house, (side line out,) 490. ohms.
Same side line in. 494 "

 Galvanometer wire 20. ohms

Dec. 2d 1880.

Insulation of lines.

Edison's Circuit,

First section, from dynamo-room to cor. opp. office. High

2d section, back of Deans house 1045. ohms.

3d section, to cor. opp. Krusis house. 283. ohms

4th section back of Krusis house 280 ohms

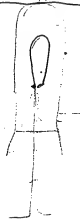
5th section back of Edisons barn. 208.

6th section, to turnpike 283. ohms

Dec 2d. Insulation.
Edisons Circuit

7th section, to Davis' hotel.
245. ohms.

8th section, to lamp factory
245. ohms.



Carmans Circuit.

1st section, to box opp. cor. of board walk.

2d. section, to M. Carmens house.
Side lines out.
N. line #1. in.
N. line #2. in
S. line in.

3d. section, to D. Carmens house
Side line out
" " in,

4th section, to box opp. Uptons corner

5th section to turnpike opp. M - Carmens house.

Depot line,
Davies line.

R. R., or 6. wire, circuit.

1st section, to box on Cedar St.
Side line out.
" " in,

2d. section, S. on Cedar St,

3d. section, N. on Cedar. St,

Dec. Insulation of lines
Back. circuit, (8. wires)

1st section, direct to first box.

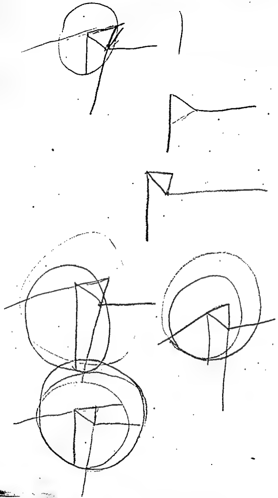
2d. section, E. to Cedar St, with side line always in,

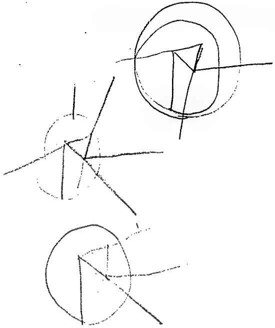
3d. section N. to Carmins, with side line always in,

4th section, to 2d. box.

5th section to Cedar St. E.

6th section N. through Corpus.





~~eru+~~.

$c(X+r+g) = c'(R''+r+g)$

$cx+\cancel{cr+cg}\; X = \dfrac{c'R''+c'r+c'g-(cr+cg)}{C}$

$cx \quad cr+cg$

$\frac{1}{3}\frac{5}{5}\frac{9}{9}$ $10(\,10 \quad 20\,),\ldots$

35

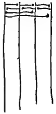
$cx \pm cr+cg = \dfrac{c'R''+c'r+c'g}{C}$

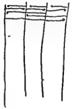
C

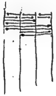
$\frac{30}{20}$ $\quad -5-8$ $\quad \cancel{15}$

1- $\quad \cancel{20}$ $\; -25+25$

$\frac{30}{20}$







30
30
50
40
190

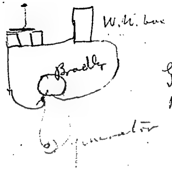
W.E. Box Generator 400 Ohms
Bell 850 Ohms

6290
2100
8390

500 ~~2600~~

3000
Good 2600
250 2100
150 1200
100 900
70 600
40 200
30 100
20 Rings

Bergmans box



Generator 820 Ohms
Bell 270 Ohms

Bradley	W.U.
	12500
	Adjusted 1500
	1300
250	
150	
100	
90	
50	Just rings

Bergmans generator on W. E. bells

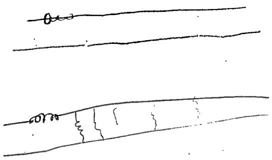
	15,700 Ohms
500	3400
	2600 again
250	1800
150	~~1700~~
	~~1200~~ bells nearer
	1500
100	1200
70	800
50	500
30	200
~~20~~	100
12	Rings

W. E. on Bergmans bell

7000 Ohms.

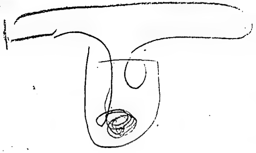
500	3800
	2000
250	1300
150	1000
100	500
70	100
50	
25	Rings

Aug 13 '80 41-41
Aug 14 '80 $39\frac{1}{2}$-$39\frac{1}{2}$



205 — 16 candles.
2[illegible] — 3[illegible]

276 —
282 aug 14-80.



tore out 1 page

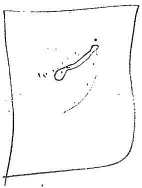
X

$40\frac{1}{2}$

$40\frac{1}{2}$

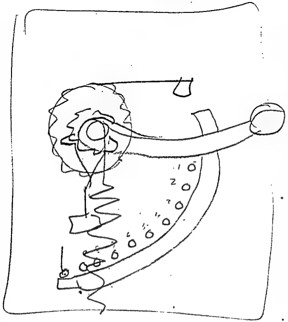
40

89½ Aug. 14-80
89½

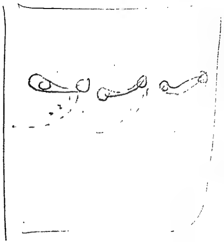


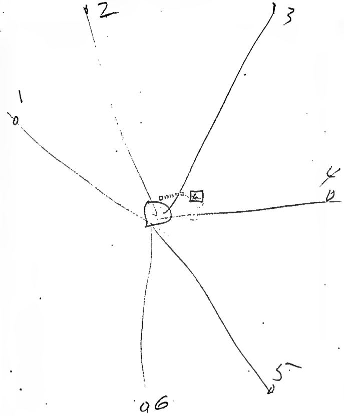
40/120/3
20
60
1.08
4.80
60
64.80

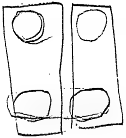
4.

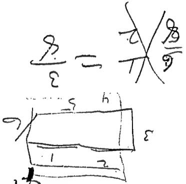


28.




1
2
3
5
6





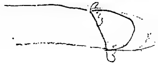
$eR + er + eg = e_1(\rho + r + g)$

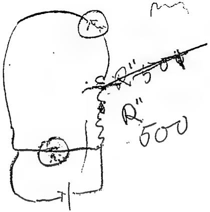
$R = e\rho + er + eg - er + eg$

$eR = e\rho + er + eg - er + eg$

$+ eg + eg = -eR + e\rho + er + er$

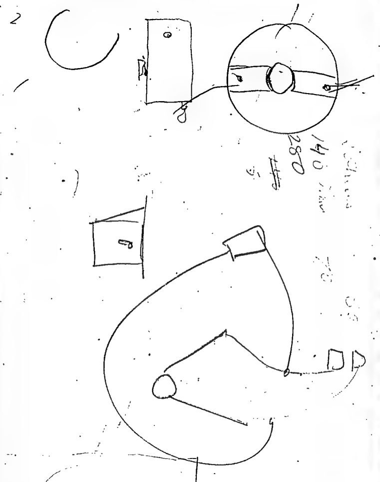
$e + e$



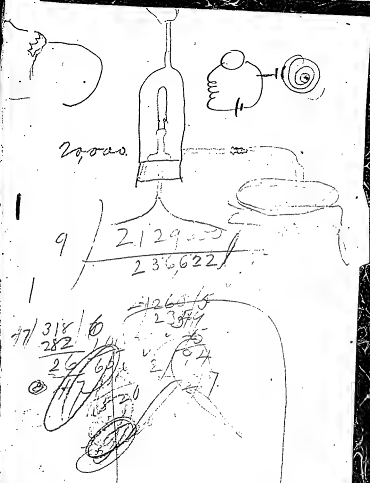


237

2



WE 4500
Berg 1100



20,000.

9 / 2129000 / 236,622

47 / 318 / 6
282
26

480
65
67.5

Menlo Park Notebook #138 [N-80-12-17]

This notebook covers the period December 1880. Each page contains a lamp number and what appear to be numbers measuring the resistance of the lamp. The label on the front cover is marked "Lamps Lot A & B," "1880," and "Francis Jehl." The book contains 284 numbered pages.

Blank pages not filmed: 202-284.

118 a

176–176
176
3352
1470

1

119a

170 − 170

2

3 | 340

113

120a

164 − 164

2

3 | 328

109

121^a

$178 - 178$

$$\begin{array}{r} 178 \\ \hline 3)\underline{356} \\ 118\frac{2}{3}\end{array}$$

122^a

$160 - 160$

$$\begin{array}{r} 2 \\ \hline 3)\underline{320} \\ 106\end{array}$$

123 a

167–167
2

124 a

175–175

125[a]

172-172.

126[a]

172-172

127a

175 – 175

128a

178 – 178

129ª

164 — 164

130ª

158 — 158

131 a
170 — 170

132 a
174 - 174

133a

162 – 162

134 a

164 – 164

135 a

163–163

136 a

167–167

137 a

169-169

138 a

167-167

139[a]
165—165

140[a]
163—163

141 a

173-173

142 a

175-175

143 a

172–172

144 a

180–179

145^a

Want up

146^a

160 — 160

147 a

~~169-16~~

168—168.

148 a

169—169

149[a]

Went up at the clumps

150[a]

200 - 200

151[a]

160 — 160

152[a]

Went up when it
was put on

153ª

154ª

170-170

155a

182-182

156a

~~1775~~

175-175

157 a

165 - 165

158 a

165 - 165

159[a]

168—168

160[a]

180—180

161[a]

152–152

Weighing in Phone room

162[a]

+ ~~#75~~

163[a]

175–175

164[a]

~~1758~~

175 – 175

165[a]

168 — 168

166[a]

154 — 154

167ª

172 – 172

168ª

180 – 180

169^a

180 — 180

170^a

180 — 180

171ª

175–175

172ª

180–180

173a

162–163

174a

153–153

175[a]

162–162

176[a]

171–171

177a

Went up in Thom
room

178a

164 – 164

179^a

166 — 166

180^a

157 — 157

181[a]

160 — 160

182[a]

160 — 160

183[a]

167—167

184[a]

155—155

185^a

163–162

186^a Aq.

155 – 153

187^a

160 – 161

188^a

170 – 170

189[a]

160 – 159.

190[a]

162 – 162

191ᵃ

160-162

192ᵃ

159-160

193ª

164–163

194ª

160–161

195^a

185 — 185

196^a

158 — 158

197ª

Went up at the Clangs! No vac

198ª ea

158—158

199[a]

160-160

200[a] Cu

169-169

B1

78 — 78 at 8 Candle

2B

84 - 83

3^B

80 – 80 – 8 Candles

4

Bushel by How.

5 B

Went up ~~ith~~ the Phone room

6 B

82-82

7 B.

84 - 84 8 Candles

8 B.

Went up at the Club

9 B

80 — 80

(16.0
5 3

10 B

81 – 81 Candles

B 16 82 — 82

✓ B 12 82 — 82

✓ B 23 80 — 80

✓ B 19 79 — 79

✓ B 20 82 — 81

✓ B 21 80 — 80

B 11 80 — 81

B 18 77 — 77 $\frac{154}{51}$

B 15 78 — 78

B 17 85 — 85

B 22 85 — 85

✓ B 14 80 — 80

47 Dec 18

47 Lamps 4 47

A 207 — 242 Steve

B 16 — 23 Dire

Vulcanized fiber Lamps 3
47

201 a

165—165

202 a

165—165

203 a

170 — 170

204 a

~~157 — 157~~

~~another~~

204

155 — 158

205 a

~~15-175~~

another

162-162

206 a

~~162-162 *~~

another

167-167

207^a

165—165

208^a

175—175

209 a

165–165

210 a

165–165

211 a

168—168

178—178

213a

175 – 175

214 a

172 – 172

215-a

177 — 177

216 a

165 — 165

217a

162–162

218a

165–165

219a

160 — 160

220a

168 — 167

221 a

170 — 170

222 a

165 — 165

223a

180 — 180

224a

173 – 174

225 a

157 – 157

165 – 165

227a

160 – 160

163 – 164

229[a]

163—163

230[a]

158—158,

231[a]

155–155

232[a]

184–184

233[a]

150–150

234[a]

155–155

235^a

Cu
158–157

236^a Cu

155–155

237a

150 — 150

238a

166—166

239a

165 – 165

240a

165 – 165

241a

163-163

242a

164-164

243[a]

175 – 175

244[a]

158 – 158

245

167—167

246

~~167—167~~

166—166

247 a

158 - 158

248 a

167 - 16.7

249a

170 — 170

250a

155 — 155

251a

~~157~~

159—159

252a

~~157—158~~

173—173

Dec 17 1880

Vulcanized fiber,

170 - 170 (Z)
$\frac{\quad\quad 2}{3)340}$
113

Vulcanized fiber

178 - 178
$\frac{\quad\quad 2}{2)356}$
118

Dec 17 1880
Vulcanized fiber
165 – 165 (X)
110

Vulcanized fibers (W)
170 – 170

340
113

Vulcanized fiber (V)

170 − 170

$$\frac{2}{3\overline{)340}}$$

113

Dec 18

Vulcanized fiber

1.66 − 166.

$$\frac{2}{3\overline{)336}}$$

112

253 a

163–163

163–163

255a

153 — 153

256a

170 — 170

257a

165–165

258a

158–158

259ª

167–167

260ª

164–164

261 a

165 – 165

262 a

163 – 163

263a

167-167

154-154

265-a

170-170

266a

158-158

267

Went up in Phone room.

268.[a]

164–164

269 a

171–171

175–175

271ª

164 — ~~164~~

272ª

156 – 156.

273 a

172. 172.

274 a

159 - 159

275a

153 - 153

276a

153 - 153

277a
160 — 160

278
165 — 165

279a

174-174

280a

174-173

281[a]

158-158

282[a]

261-261

283a

158–159

284a

/ 165–165

285^a

164 — 164

155 — 155

287a

172–172

288a

162–162

289^a

160 – 160.

B26

85 – 85

B - 24

88 – 88

B - 33

85 85

B - 13

90 - 90

B - 27 - 27

85 - 85

$$\begin{array}{r} 85 \\ \underline{17} \\ 56 \end{array}$$

B - 28 - 28

85 - 85

B – 34 –

81 – 81

B – 32 –

85 85

B – 30 –

85 – 85

B – 31

87 – 87

B_25 88-88.

a17

172[a]

185–185

---

a
212

175–175

---

a 190
170–170

232[a]
180–180

171[a]
169–169

243[a]
169–169

188[a]
165–169

186[a]
165–165

113[a]
185–185

182[a]

168 – 168,

187[a]

188 – 188

191[a]

163 – 163

~~215[a]~~ 208

180 – 180

---

no. of lamps		defective
313 –	175	
320 –	165	
325 –	166	
329 –	162	
[illegible] –	[illegible]2	
326 –	162	
321 –	166	
31[illegible] –	[illegible]	
31[illegible] –	[illegible]	
306 –	165	
30[illegible] –	163	
3[illegible]9 –	160	
314 –	165	
323 –	165	
333 –	169	
327 –	169	
331 –	165	
334 –	169	
319 –	165	

Menlo Park Notebook #139 [N-80-01-07]

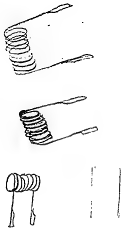
This notebook contains two pages of entries, dated January 7, 1880. The entries are by Charles Batchelor and consist of notes and drawings for carbon spiral lamps. The book contains 284 numbered pages.

Blank pages not filmed: 4-284.

Jan 7 1880

6 Spiral lamps for Edison

Made 1 Carbonizing mould
3 Screws for winding Spirals
took 30 fibres



Menlo Park Notebook #140 [N-80-12-21]

This notebook is undated with the exception of one entry for December 21, 1880. It was kept by an unknown member of the laboratory staff and was used primarily to record cable codes for shipments of bamboo. The book also contains a copy of the "instructions given to Messrs. Russell & Co - Hong King and Canton." The label on the front cover is marked "Cable Words." There are 284 numbered pages. Only the instructions have been filmed.

Copy

Instructions given to
Messrs. Russell & Co.
Hong Kong and Canton

Please procure musters
of all Bamboos of which
an unlimited supply
can be obtained, to combine
the following requirements

1st To have a very hard
and dense fibre or
wood on and near
the outer edge —
2nd The joints should be
as straight as possible
3rd Should measure
not less than nine
(9) inches in length
between the divisions

and not less than
four (4) inches in
circumference
4th Top of poles should
not be used as
the wood is not
so hard or dense as
when cut from the
lower or middle
portions of the poles
5th Lowest price for
poles cut into con-
venient length for
shipment say 6 or 8 ft.
also give average
circumference of
same —

Bamboos should be clean, well seasoned and free from insects

6th Lowest price for poles sawed between joints and split in halves

Length of joints 8 in. per 1000
do " " 10 " " 1000

State average circumference

7th Lowest price of poles cut up into fibres

Size 8 in. long x $\frac{3}{16}$ in. per 1000
" 10 " x $\frac{3}{16}$ " " 1000

In lots of 100.000 to 1000.000 per month

8th State all charges for packing, shipping etc

Borneo and adjacent islands

Fiber of Cocoa-nut, betel, Sago and gomati - used to make Cordage

Celebes and adjacent islands

Bamboo grows to height of 40 feet

Menlo Park Notebook #142 [N-80-11-27] (NOT FILMED)

This notebook covers the period November-December 1880. It was kept by an unknown member of the laboratory staff to record shipments of bamboo. The book contains 284 numbered pages. Approximately 10 percent of the pages have been used.

Menlo Park Notebook #143 [N-82-11-14]

This notebook covers the period November 1882-June 1883. The entries are by George Gibbs and Thomas P. Conant and relate primarily to chemical experiments. Included are notes and a few drawings concerning experiments to produce marks on paper, probably for an electric meter. There is also material pertaining to storage batteries, carbon filaments, cements for sockets, and mica insulation for dynamo brushes. The last half of the book is by Conant alone and relates to electric meter experiments. The book contains 284 numbered pages.

Blank pages not filmed: 1, 274-281.

Missing page numbers: 69-72.

Experiments with Oil of Aniline. Nov. 14th /82. J. G.

Failed to obtain a solution in Oxalic Acid (either in the hot or cold) containing perceptible traces of the oil.

No solution with Salicylic Acid.

No solution with Boracic Acid

Obtained a solution with Sulphuric Acid and tried the following combinations with the results given below.

H_2SO_4 sol. alone — no mark.

+ NaCl — " "

" + $Co(NO_3)_2$ — " "

H_2SO_4 sol. + ~~Iodide~~ of Ca " "

" Sesquichloride of Fe " "

" Cyanide of K " "

(over)

H_2SO_4 sol. + Acetate of Hg – no mark
" " + Protochloride of Fe " "
above + $Co(NO_3)_2$
H_2SO_4 sol. + Carbonate of Mn " "
above + NaCl
H_2SO_4 sol + MnCl " "
above + $Co(NO_3)_2$ + $CuSO_4$ " "

Obtained a solution in the Hydrochloric Acid, but could not get a mark on the paper. The foregoing compounds were tried: HCl sol.
above + Bromide of Sodium
+ Chloride of Cobalt;
NaCl + " " " "
Sesquioxide of Lead;
Sesquichloride of Iron;
Chloride of Copper.

Nov 15 /42 J. P. C.

Acetic acid Solution
formed slowly in the cold
easily upon application of
heat. Current
derived from four quart
cells (bichromate) in series,

Solution alone gives fairly
distinct mark up to 2500
ohms.

With addition of salt
gives same result up to
about 3000 ohms

With salt and Chloride
of Cobalt gives good
black mark up to about
3000 ohms

With Chloride of Cobalt
gives about same result
not so distinct however.

With Chloride of Cobalt and
Chlorate of Potash gives good
black mark up to 2500 ohms

With same plus salt. mark
fairly black up to 2000 ohms

With Chlorate of Potash
gives fairly distinct mark
up to 2500 ohms.

Same plus salt gives about
same result.

With Sulphate of Lead
gives fair mark up to
2500 ohms.

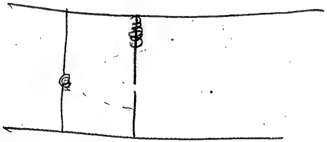
With Bromide of Sodium
x faint mark to 2000 ohms x

---

x Red oxide of Lead gives
good mark up to 2000 ohms

Same plus salt gives
much darker mark up to
2000 ohms.

- Tartrate of soda	- no result
Bisulphite "	- " "
Hyposulphite "	- " "
Sulphate of Potash	- " "
Caustic " "	- " "
Chromate " "	- " "
~~Chromic oxide~~	- " "
Chloride of Mercury	- " "
acetate " "	- " "



Sulphate of Iron - no result
Citrate of Iron & ammonia - " "
Chloride of Manganese - " "
Protochloride of Tin x - " "
Phosphoric acid - " "
Cobalt Nitrate x - " "
Dextrine - " "
Each of above + salt - " "

Carbonate of copper gives black mark up to 2500 ohms and faint mark up to 15000 ohms

---

Same plus salt gives much clearer results up to same figures

Plus salt and chloride of Cobalt gives better results (same resistance

The marks obtained by use of the acetic solution become intensified by action of light and the strips of paper become somewhat yellow

---

Chromic oxide - good result
" " + salt " "

Nov. 15th /82 George Gibbs

Obtained no results with a solution in Pyrogallic acid.

Obtained a solution in Nitric Acid, with the following results:—

NHO_3 sol.			none
"	"	+ Bichromate K	"
"	"	+ Iodide K	fair ml
"	"	+ Ferrocyanide K	none
"	"	Cyanide K	"
"	"	NaCl	"
"	"	+ NaCl + Ferrocyanide K	"
"	"	" Cyanide K	"
"	"	+ Potassium Chloride	"
"	"	+ Bisulphate Na	"
"	"	+ Bromide Na	"
"	"	+ Ammonium Oxalate.	"
"	"	+ $(NH_4)HS$	"
"	"	+ $(NH_4)Cl$	"
"	"	+ MgCl	"
"	"	+ HgCl	"

(over)

Nitric acid Solution, (Concluded.)

HNO_3 sol. + $PbSO_4$ none
" " + $(NH_4)_2Cu(SO_2)_2$ "
" " $CuSO_4$ "
" " $ZnSO_4$ "

Solution in Tartaric Acid.

(tried). —

Solution alone gives faint mark up to 3000 ohms, but fades rapidly on exposure to light.

Solution and NaCl; - about the same result - faint and worthless.

With Chloride of Cobalt, — faint up to 2000 ohms. Green.

With $KClO_3$ gives good green marks up to 3000.

With acetate lead gives faint green marks up to 3000 ohms.

Solution of Ferrocyanide of K. gives faint green mark, but with little contrast, the paper being green itself.

Carbonate of Copper gives green mark with whole resistance in (some 15000 ohms).

Carbonate of Cu. and oxalate of Ammonium ~~gives~~ give same result.

Sulphate of Copper — same result.

Sesquichloride of Iron gives a very faint mark on dark colored paper.

Protochloride of Tin gives no mark.

All of the above fade rapidly upon exposure to light.

Succinic Acid Solution:

No results obtained, with various combinations, through 15000 ohms.

Experiments with Trolazin
No result with Aqueous sol.
when treated with various
compounds.

Experiments with Nitro-
-Benzol Nov 16/82 J. P. L

With acetic acid, no
solution.

With Sulphuric acid no
Solution

With Hydrochloric Acid no
Solution. —

Experiments with Dextrine
water + acid solution
gave no results whatever

Experiments with Anthracene. Nov 16th 1879.

No solution the acids.
It was oxidized by a mixture of H_2SO_4 and potassium bichromate, but made no mark.
No mark with the above + $NaCl$, or $KClO_3$ or $CoCl$.

Nov 17 /82 J. P. C.

Paper soaked in starch and iodide of Potash gives good results which however are not permanent as the entire strip upon exposure becomes highly colored

The addition of a Chloride prevents this but also has an injurious effect on the mark causing it to fade after a time

The best results are obtained by the addition of $KClO_3$

$NaCl$ - not permanent

KCl - " "

KNO_3 - good result

Carbonate of soda - not permanent

Nov. 18th/82. G.G.

Tried HCl & indigo, but could get no mark. —

Acetate of Lead solution on paper gives dark mark, but is slow and of high resistance. Nitrate of Lead solution is much better giving a fine black mark up to 1500 ohms, but is slow. —

Nitrate of lead and chloride of cobalt gives a faint mark of no practical use.

Acetate of lead + KI gives a mark which fades quickly.

$PbCl_2$ gives no mark, also litharge, PbI_2 or PbS_2. —

Bichromate of potassium; - no result; also Bichromate with $CaCl_2$ or with $KClO_3$, or sesquichloride of iron. —

Failed to get $CrCl_2$ on paper, or CrO. —

No result with Chlorides of Cobalt. Failed to obtain cobaltic oxide (Co_2O_3) (black), on paper by liberating Cl with mixtures of cobalt salts.

Tried cobalt salts ammonium
Sulphide with strong acid,
chloride of tin and Sulphate of
Sodium is no good, also nitrate
of potassium.
Nitrate of Strontia, also fluor
$KClO_3$ (no mark.) Also Per-
oxide of Lead. Acetate of
mercury. Oxide of Cobalt
+ with $KClO_3$. (0) Sulphate
of potassium + with
[illegible] of iron.
Sulphate of lead in solution
in nitrate of ammonium

Nov 20/1-7, 8. C

Ferrous salt + KCNS when
oxidized gives red mark but not
permanent - the action is not improved
by addition of other salts.

Acetate of Mercury and
sulphate of iron - no result
Antimonic acid alone +
with NaCl - no result.

Protochloride of tin alone — nothing! — with ferrocyanide of potassa — blue marks on pale blue paper

Nov. 21 /82 J. F. L

Sulphate of iron — no result
" " + $KClO_3$ — " "
" " + NaCl — " "
" " + Pyrogallic acid " "
mixture of above " "

Nov 22 /82 J. F. L

Nitrate amyl — no result
" " + $FeSO_4$ " "
" " NaCl " "
" + NaCl + $KClO_3$ " "
" + " + " + $FeSO_4$ " "
+ sugar alcohol "
" + " + $FeSO_4$ "
" + $CoCl_2$ "
" + " + sugar alcohol

Nov. 22nd /92

Ferrocyanide of potassium E.G. +

$KClO_3$ gives quite good green marks on white paper, up to 1500 ohms resistance, permanent. This was the best green mark obtained with various combinations mentioned below. The following also gave green marks; —

Ferrocyanide of K + KCl
" " + $NaCl$
" " + KNO_3
" " + KNO_3 + $KClO_3$
" " Bromide Soda.

Tried the following with results given: —

Ferrocyanide + KCl + $NaHO$. (none)
" K_2SO_4 (")
" $CaCl_2$ (")
" + $KClO_3$ + Hyposulphite K (faded)
" $KClO_3$ + Chromate K (poor)
" $BaCl_2$ (")
" $CoCl_2$ (precipitate on
" HNO_3 (blue paper) []

Nov 22 /82 J. P. C

aniline Purple

H_2O solution + $CaCl_2$ - blue

" " + Na Hypo - no change

" " + KNO_3 - " "

" " + NH_4NO_3 - " "

Black aniline - no results

Nov. 23rd /82. — George Gill

Experiments with Aniline purple. —
H_2O solution with NaCl — faint green mark on purple paper when small quantity of salt was used, but no result when enough NaCl was used to make the solution.
Aniline sol. and ferrocyanide of potassium gives green mark on purple paper up to 1000 ohms; but is slow and not very permanent!
Tried aniline solution with varying proportions of ferric chloride — in all ten samples — Obtained ~~soluble~~ with small proportion of chloride a pale green mark on purple paper. With large proportion of ferric chloride got green mark on green paper. All these marks fade after two or three hours exposure in sun.
Sulphate of Iron precipitates the coloring matter from the Aniline solution.

Nov 23 /82 T. P. C

H_2O sol blue flag - no result
" " + $KClO_3$ - " "
" " + " + NaCl - " "
" " + $NiNO_3$ - " "
" " + oil of aniline " "
" " + Pyrogallic acid - faint

H_2O sol Brazil wood
alone + reducing current - blue
" + oxidizing " - white
+ NaCl - more sensitive
+ $KClO_3$ - " "
+ KNO_3 " "
+ NaCl + $KClO_3$ " "
+ K ferro cy - faint blue
+ $FeSO_4$ - no result
+ " + NaCl " "
+ Na_2CO_3 " "

not permanent

H_2O sol Brazil wood

" + CaFl – no result

acetate of Co – " "

" + " + $HC_2H_3O_2$ – " "

Decolorized with peroxide of Lead and tried to restore by current – no result

H_2O sol + alum – no result

" " + $CuSO_4$ – " "

" " + " + NaCl – " "

" " + Cu acetate – " "

" " + Cu salts + alum – " "

" " + ZnO – " "

Experiments with "Dye Wood".
Tried solution of dye-wood in H_2O alone and with Ferric chloride - no result. —
I find that "dye-wood" gives faint reactions, not as marked as with "brazil-wood" but similar in color &c. ——
A Solution of Cudbear! in H_2O when treated with NaCl and $KClO_3$ gives a fine pale yellow mark on red paper with oxidizing ~~paint~~ platinum point, but the colors rapidly fade ——
Tried Oil of Organum with Acetic acid, nitric, hydrochloric and sulphuric, but failed to get a complete solution or the faintest mark with NaCl or $KClO_3$ or $COCl_2$ &c. ——
~~Tried Carbonate of Iron in H_2O — no result.~~ —

Nov. 23rd G. G. —

Tried a solution of copper sulphate and acetic acid then potassium carbonate; — no mark.

Also solution $CuSO_4$ and acetic acid + $NaHO$ — no result.

Nov 24/82 J. P. C.

H_2O sol Brazil wood
+ acetate of Al — no result
same + tartaric acid — " "

Napthalin sol in H_2O + alcohol no result
" " " " + NaCl "
" " " " + $KClO_3$ "
" + NaCl + " "
" + $KClO_3$ + $CoCl_2$ "
" + Brazil wood "

Nov. 24th/82. G. G.

Tried $CuSO_4$ with tartaric acid & then $CaCO_3$ - no result.
Tried Cupric Sulphide dissolved in potassic cyanide - no mark.
Tried black oxide of copper dissolved in HCl, or cupric chloride; obtain a black dot when point was held on paper for a moment (with no resistance in) it faded out almost immediately. —

Tried Hyperoxide of manganese in H_2O. with reducing current obtained a black mark, but found it very slow, as in the case of blk. oxide of Cu above.
Tried Acetate of manganese in H_2O — a faint mark obtained (n.g.) — Also acetate of Mn + NaCl - faint and not sensitive.
Tried Carbonate of Iron in water - no result.

Nov. 24th/82. George Gibbs.

Tried Manganous Chloride in H_2O. got a fine mark on white paper up to 2000 ohms resistance. Both the mark & color of paper are permanent. Tried above solution with NaCl with about the same result — also with $KClO_3$, the same. With Potassium nitrate — about the same — not more sensitive. With nitrate of ammonia — the same, with $(NH)_4NO_3 + NaCl$ — no perceptible difference. Last exp. + $CaCl_2$ — no improvement.

Nov. 25th/82. — G.G.

Tried Bi-sulphate soda added to $MnCl_2$ solution — no mark. —

Sulphate of potassium & $MnCl_2$ sol. — no mark.

$MnCl_2$ sol. + $(NH)_4SO_4$ — no mark.

Sol. with $CuSO_4$ — increased sensitiveness, getting a faint mark through

Nov 25 /82 ~~J. A. C.~~ G. G.

whole resistance. but paper turned green and mark disappeared after a while.
Tried Sol. with Sulphate of Iron. got a good mark (with low resistance), but it faded immediately.
Tried Sol. with Sulphate of Zinc. Got a very good mark through whole resistance. Perfectly permanent & on white paper.

Nov 27 /82 J. P. C

Brazil wood sol in H_2O & $HC_2H_3O_2$ - no result
same sol + $CaCl_2$ - " "

Tannate of Iron

Tartaric acid solution - 0
" " + NaCl - 0
" " + $NaH_3C_2O_2$ - 0
" " NaCl + " - 0
" " + NaBr - 0
" " + " + NaCl - 0
" " + Bisulphite Na - 0
" " + Pyrogallic acid - 0
" " + " + NaCl - 0
" " + $NaHPO_4$ - 0
" " + KCNS - red fades
" " + " + Pyrogallic acid - "
" " + NH_4NO_3 - 0
" " + acetate Al - 0
" " + MgCl - 0
" " + Protochloride Sn - 0
" " + $Pb(NO_3)_2$ - 0

Nov 28 /82. J. P. C.

$Cu(C_2H_3O_2)_2 + NH_4Cl + ZnO$ - 0

Fustic H_2O sol alone - 0

" " " + NaCl - faint yellow

" " " + " + alumin acet - "

" " + alum + sodium tart 0

" " + " + $SnCl_2$ 0

Brazil wood H_2O sol

" " + Ferri Tannic + $SnCl_2$

gave red paper - blue streak, fading

Chloride of Platinum - 0

" " + NaCl - 0

" " + " + $KClO_3$ - 0

" " + NaBr - 0

Nov 29 /82 J. P. C.

$Mn(SO_4)$ H_2O sol-sat. 3000 ohms
" + H_2SO_4 - faint all
" + $ZnSO_4$ - " "
" + Bisulph Na - 0
" + NaCl - 3000 ohms
" + $KClO_3$ - 2500 "
" + KNO_3 0
" + $Pb(NO_3)_2$ - 2500
" + $PbSO_4$ - "

The mark from the $Pb(NO_3)_2$ seems to turn darker with time that from the $PbSO_4$ not changing

Dec 1 / 82 J. P. C.

$Mn(SO_4)_2 H_2O$ - sat sol

with $CuSO_4$. - 2500 ohms

" $Pb(NO_3)_2$ and

some $PbSO_4$ which forms

on the paper - 3000 ohms

faint up to 10000 ohms.

+ $FeSO_4$ - no result

+ $BaSO_4$ (formed on paper)

up to 1500 ohms

Experiments with Cement:—
Saturated solution of chloride of magnesium; and magnesia (MgO).—
I find that one part by weight to one part by volume is about the maximum quantity that will be absorbed. This forms a thick paste, and will set and become very hard in 12 hours. A less number of parts by weight may be used, but will require longer time in setting.

This cement will harden with from 15 to 20 times [illegible] own weight [illegible] [illegible] [illegible]

Dec 2 - J. P. C

Experiments on storage battery
Two plates of Cu in KCl sol
of I
also two Cu cylinders in
porous cups containing I sol
in Na_2CO_3 - cups being in
glass vessel containing
Na_2CO_3 sol

Dec 4 T. P. C

Made up sol of
acetate aniline + NaCl +
$KClO_3$

also
$MnSO_4$ for test
of paper in quinta

Dec 5 J. P. C

Experiments on cements

Sat sol $CaCl_2$ + Sinslaked lime

made test plates and also coated wires

sat sol $ZnCl_2$ + ZnO as above

The difficulty is with these that they crack off when dry

Took the following solutions (cold) and placed wires in them

$NaOH$ - no coating

$NaHPO_4$ - " "

$NaBr$ - "

$Co(NO_3)_2$ - coating (not insulating)

Hg acetate - no coating

NH_4Cl - " "

arsenious acid - coating (not insulating)

I - " "

K_4FeCy_6 " "

KCy - " "

$MgCl_2$ - coating partly insulating

$CaCl_2$ - " "

The previous tests repeated
but with about same results

Tried to obtain coating by
electrolysis using same
solutions
The trouble is that the coatings
crack off on drying
The best result is from the
$CaCl_2$ sat sol which
forms caustic hydrate of lime
giving a good insulation
which however will peel
off on drying
(The CaOH forms on the Cathode)

Dec 11 - T. P. C 44.6

Tried waterglass
This insulates well and is elastic
Tried Fluoride of calcium - no good - rubs off. -
The water glass does not stand a red heat and would not fuse on the wire but instead swelled and cracked off owing to burning of the Na.

Dec 12 J. P. C 4GA

Wire insulated by silk was soaked in tungstate of soda the object being to render said insulation fire proof. The result was unsatisfactory as the coating became charred and rubbed off.

Tried asbestos paint but could not dry it on the wire

In attempting to dry by heat the oil would burn out leaving a coating of asbestos which although a good insulator, cracked off easily

Dec 12th/82 G.G. ——

Tried the following fluxes:—

1) Flint-Glass 10 Wt.
White Arsenic 1 "
Nitre 1 "

2) Red Lead 1 "
Flint-Glass 3 "

3) Red Lead 1 "
Calcined Borax 1½ "
Flint powder 2
Flint Glass 6 .

These were fused and then powdered. A paste was made of the powder and the wire coated with this.
It did not succeed well, as the paste rubbed off, and if the wire was heated so as to fuse the paste, the temper was taken out. ——

Dec 13 T. P. C

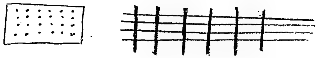
Chromate of K gave by electrolysis a coating on the wire which did not insulate.

$(NH_4)_2SO_4$ = same result.

KNO_3 = no result

oxalate of K = good insulation wire a less elastic but not capable of ~~withstanding~~ a red heat

Dec 13th G.G. —

Tried mica insulation for brushes as follows; —

A number of holes were punched in mica plates, and wires composing brush pushed through them as shown. —

Dec 15 /82 J. P. C

cemented plates of Mica with $MgCl_2$ + MgO

Dec 19 /82 J.P.

Made lamp-socket of $MgCl_2$ sat. sol + MgO (good)

Dec 20 / 82 J. P. C.

Made up following cements.

1. 5 c.c. sat sol $MgCl_2$
1 gm MgO
10 " chalk fine

2. 5 c.c. sat sol $MgCl_2$
1 gm MgO
15 " Fine clay (quartz)

3. 5 c.c. sat sol $MgCl_2$
1 gm MgO
17 " Feldspar
good but slow

Dec 20 (continued) /82

T. P. C

4 5 c.c. sat sol $MgCl_2$

1 gm MgO

10 " Pon. Kaolin

5 5 c.c. sat sol $MgCl_2$

1 gm MgO

10 " Silica

slow - fair

6 5 c.c. sat sol $MgCl_2$

5 " Glue H_2O

10 gm MgO

bad

Dec 21 /82

J. P. C

7 5 c.c. sat sol $MgCl_2$
2 gm MgO
10 " chalk
fair

8. 5 c.c sat sol $MgCl_2$
2 gm MgO
15 " clay
good

9. 5 c.c sat sol $MgCl_2$
2 gm MgO
slow good

Made lamp socket
20 c.c - sat sol $MgCl_2$
10 gm MgO.
good.

Dec 21 (cont.) /02

J. P. C.

1/ 10 c.c. sat. sol. $MgCl_2$
10 gm (good result) MgO

2/ 10 c.c. sol. ($\frac{1}{5}H_2O$) $MgCl_2$
10 gm (good result) MgO

3/ 10 c.c. sol. ($\frac{1}{10}H_2O$) $MgCl_2$
10 gm (good) MgO

4/ 10 c.c. sol. ($\frac{1}{3}H_2O$) $MgCl_2$
10 gm (fair) MgO

Dec 21 cont. Ad 2

J. P. L

5/ 10 c.c. sol ($\frac{1}{2}H_2O$) $MgCl_2$
10 gm (fair) MgO

6/ 10 c.c. sol ($\frac{3}{4}H_2O$) $MgCl_2$
10 gm (no good) MgO

7. 10 cc H_2O
10 gm (no good) MgO

Dec. 22 /82 T. P.

5 c.c. sat sol $MgCl_2$
3 gm MgO
7 " Silica

good. slow

5 c.c. sat sol $MgCl_2$
5 gm MgO
5 c.c collodion

bad.

5 c.c. sat sol $MgCl_2$
5 gm MgO
2 c.c. Linseed oil

bad

Dec 22 continued /82 J. P. C

5 c.c. sat sol $MgCl_2$
2 grm MgO
5 " Phosphate Lime

fair

Tried to form a cement with mixture of slaked lime This was a failure as the lime would not mix in but made the cement very granular

5 c.c. sat. sol. $MgCl_2$
2 grm MgO
11 " Feldspar

good

Dec. 23/82
J. P.

5 c.c sat sol: $MgCl_2$
4 gm MgO
5 " Silom
good

Lamp socket
20 c.c $MgCl_2$
20 gm MgO
(Good)

Dec. 26 /82
J. P. C

cement of $Mg Cl_2$
+ $Mg O$ + glutin
(rough experiment) N.G

Made experiment of
depositing carbon upon
carbon filament in
kerosine oil. by means
of spark from arc
carbon and by heating
to incandescence

Dec 27/82

T. P. C

Lamp socket

30 c.c - $MgCl_2$ ($\frac{1}{6}$ H_2O)

10 grm - MgO

6 " Burnt alum

N. G.

Jan 2 /83
J. P. C

Plug
30 c.c. sol $MgCl_2(6H_2O)$
8 gm MgO
5. " Silica
form not found

Cement
$MgCl_2(6H_2O) + MgO$
$+ CaCl_2$
to test drying properties
of the chloride.

N. G

Jan 2 /80
J. P. C

cement

10 c.c. $MgCl_2$ ($\frac{1}{3}$ H_2O)
5 gm MgO
15-20 " $CaCl_2$

set rapidly but
remained wet on the
surface

Note. This cement after
standing for several
weeks went all to
pieces.

Jan 3 / 89
J. P. C

Cement

10 c.c. sat sol. $MgCl_2$
5 gm MgO
14 " soapstone

F (a little soft)

Jan 4/03

10 c.c. sat sol $MgCl_2$
7 gm MgO
14 " Soapstone.
F good

Try these three

10 c.c. sat sol $MgCl_2$
5 gm MgO
20 " Soapstone
F
good

10 c.c. sat sol $MgCl_2$
5 gm MgO
22 gm Soapstone
H good

10 c.c.
10 gram Oxide mag

Jan 4 /83

J. P. C

10 c.c. sat sol $MgCl$
9 gm MgO
8 " soapstone
/// (Very good)

---

10 c.c. sat sol $MgCl_2$
10 gm MgO
10 " soapstone
15 " (good) Feldspar

---

10 c.c. sat sol $MgCl_2$
5 gm MgO_2
5 " soapstone
5 " (poor) Kaolin

Jan 4 / 83

3, P. 2

10 c.c. sat sol $MgCl_2$
6 gm MgO
5 " soapstone
5 " Feldspar
5 " Kaolin

poor A

Jan 5/13

J. P. C.

10 c.c. sat. sol. $MgCl_2$
5 gm MgO
10 " $CaCO_3$

good - slow

Jan 6 / 83

J. P. C

socket

20 c. c. sat sol $MgCl_2$
18 grm MgO
16 " soapstone
very good

Jan 8 / 83

J. P. L.

15 c.c. sat sol $MgCl_2$
7 gm MgO
11 " soapstone
P slow

---

15 c.c. sat sol $MgCl_2$
5 gm MgO
20 " soapstone
//// slow

---

15 c.c. sat. sol $MgCl_2$
5 gm MgO
22 " soapstone

V slow

Jan 9 /83 J.F.O.

20 c.c. sat sol $MgCl_2$
7 grms MgO
14 " soapstone
(Good)

20 c.c. sat sol $MgCl_2$
5 grms MgO
20 " soapstone
(good)

10 c.c. sat sol $MgCl_2$
3 grms MgO
20 " soapstone
10 " feldspar
(good)

Jan 9/83

J, P, E

10 c.c. sol ($\frac{1}{3}H_2O$) $MgCl_2$
5 gms MgO
20 " soapstone
Δ (slow)

Socket-

20 c.c. sat sol $MgCl_2$
10 gm MgO
20 " $CaCO_3$
5 " soapstone
(good)

10 C.C. sat sol $MgCl_2$
2 gms MgO
12 " Plaster Paris
slow setting

Jan 10/83 S. B. C

10 c.c. sat sol $MgCl_2$
5 gm MgO
14 " Plaster Paris
fair

---

10 c.c. ~~sat~~ sol ($\frac{1}{5}$ H_2O) $MgCl_2$
5 gm MgO
15 " Plaster Paris
fair

Plug
25 c.c. sat $\frac{1}{5}$ H_2O $MgCl_2$
10 gram MgO
" fair Plaster Paris

Jan 31 / 83

taken	result
20 c.c. conc H_2SO_4 —	partial
" + 1 c.c. H_2O	"
" + 2 " "	"
" + 3 " "	"
" + 6 " "	
" + 7 —	good (very)
" + 9 "	partial
" + 12 "	saponification
" + 4 "	good
" + 5 "	"

20 c.c. H_2SO_4 to (4 to 7) c.c. H_2O is best

Note. above was a trial on parchmentizing

J. P. Conant

Feb 24 /'10

Experiment to prevent oxidation of Zinc water plates.

Standard sol.
3 1/2 Kilos $ZnSO_4$ to
35 litres dist H_2O

Tried the following
standard sol + 2 % glycerine
" " + 5 " "
" " + 15 " "
" " Boiled
" " + Zn amalgam

J. P. Conant

Feb 26 /13.

Pptd + NH_4OH and redissolved ppt in "

added $HC_2H_3O_2$ till slightly acid

crystal of alum

200 c.c standard sol + 1 gm dextrin

" " " + 2 " "

" " " + 4 " "

" " " + 1 gm of Pyrogallic acid

Tried also alkaline sol of pyrogallic but always formed a precipitation on adding to solution

J. B. Conant

Feb 27 / 83

200 c.c. stan. sol. + 1 gm sugar
" " " + 4 " "
" " " + 10 " "

Placed copper turnings in bottom of jar also pure tin.

$FeSO_4$

Boiled and covered with a olive oil b Turpentine. c castor oil d cubeb oil

Plated Zn on amal Zn and then reamal. then

plate was then suspended in sol

Tragacanth

alcohol

Brazil wood sol

sugar alcohol

sulphuric Ether

sulphate Morphine

J. P. Conant

Feb 28 /8/3

Sol boiled and covered
with collodion

German silver turnings
placed in sol

Made Commutator
of stuff cement

for Motor

J. P. Conant

Mon 1 /8/3

Sol. boiled and covered with <u>oil of organium</u>

<u>Turmeric</u> sol added

<u>Napthalin</u> "

<u>Chloral Hydrate</u> "

J. B. Conant

Mar 2 / 81

Placed in sol a large plate = 4 times surface of smaller

$PtCl_2$

CS_2

$H_2K_2Sb_2O_7$

Spongy lead placed in bottle (not in contact)

~~same with~~

also antimony

Mar 2 /83 (continued)

Sol boiled and covered with oil Monarsed

---

also with oil Lenongras

J. P. Conant

Mar 3 /83

Experiment to determine loss of weight of plate due to action of

a. alum.

wt of plate = 42,419 grs

" " alum = 0.7625 "

300 c.c. standard sol

b acetic acid

wt of plate = 85,6655 grs

acet acid - 3 c.c

300 c.c. stan. sol.

Sol boiled and covered with oil while trying

NH_4Cl added

Mar 3 /40 continued

added creosote

sol. boiled & covered with oil of Tansy

added Na Cl

J. P. Conant

Mar 5/80

Experiment to obtain a glass from substances free from alkali

Litharge — no good

J. P.

(over)

Mar 6 /83

Sulphate Lead + SiO_2
works fairly

Silico fluoride Barium
alone & + SiO_2 - good

Sulphate of Lead alone
& + SiO_2 - works well
but requires a high temp.

Carbonate of Lead
works very well and
fuses in bunsen flame

T. B. Conant

Mar 8 /83

Metin Experiment

sol gust acid + acetic acid

wt of plate = 85,694 gms.

300 c.c. stan sol

wt of plate - 82.478 gms

alum - 2 gm

Phosphoric acid

KCy = precipitates

oxalic acid "

J. P. Conant

Mar 10 / 93

Experiment having for its object the coating of a carbon with lime

The following solutions were tried the electrodes being thin rods of carbon.

calcic hydrate
" anhydride
" carbonate
" acetate
" chloride +
" sulphate
" succinate
" oxalate (in HCl)

J. P. Conant

Mar 12 /83

(Meter) wt of Plate = 45.68625 grs

Solution rendered strongly acid by acetic acid

For coating carbon.

Magnesium chloride — 0
" Nitrate — 0
" Sulphate — 0
" acetate — 0
" Citrate — 0
" Calcium ofp sugar sol — 0

Carbolic acid in Meter

Tartaric acid "

Citric acid "

(Melin)

Borax = ppt.

added Na_2SO_4

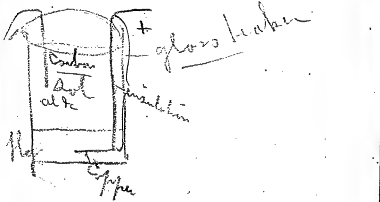
" Chromic acid

" $ZnCl_2$ {Very little

Thomas P. Conant

Mar 13 /83

For plating carbon;
sol of aluminum Sulphate
+ NaCl -



also same with no
NaCl

---

also al sulph with
two carbon electrodes

Mar 13 /03 Continued

acetate of aluminium
chloride " "
oxalate " cerium in HNO_3

Coated inside part (clamps wires &c) with thick solution of gum tragacanth

---

Made strongly saturated solution of $ZnSO_4$ to see if plates would oxidize in this

---

J. P. Conant

Mar 14. /83

Determination of H_2O in $ZnSO_4$

wt crux = 3.330 grs
" " + $ZnSO_4$ = 5.633 "
" + D = 5.190 "

5.633	5.190	4.808	2.303
3.330	3.330	3.330	1.478
2.303	1.860	1.478	.825

wt + 2D = 4.808
wt + 3D = 4.815 N.G.

825.000 ⟌ 2.303 = 35 % H_2O
6909
13410
11515

J. P. C

Mar 14.

Plate from alum sol of

Mar 8 = 82.4780 gms
wt = 82.4645 gms
0.0135 gms

loss = 13.5 mgs in 6 days
from 2 gms alum

.013 / 82478

13.000000 / 82478
82478 .00015
475220
412390 .015 %
62830

13.5000000 / 82478
82478 .000163
525220
494884 or 0.0163 %
303520
247434 J. B. Conant

Mar 15 /82

covered clamps & wires of inside part with collodion and carbonized in linseed oil (- V, G)

---

carbonized coating of tragacanth prepared on the 13th as above

---

covered clamp &c with thin leaf tragacanth, the leaf being moistened and wound on

---

considerable quantity of gum is required as it contracts very much on drying and heating

(over)

Mar 15 /80

Wt of Plate = 77,9935 grs
" " NH_4Cl = 0,500 "
300 c.c. sol

Wt of Plate = 77,672 grs
" " Na_2SO_4 = 0,500 "
300 c.c. Sol

Plated aluminum on carbon from Al. sulph

J. P. Conant

.7625 : 1 :: 6.456 : x

6,456 000 / .7625

6 100 00 — 8.45 x

35600

30500

51000

Mar 16 /80

Plate from alarm rod of Mar 3.

wt Mar 3 = 92.419 grs

" " 15 = 92.405

.014 grs

.014 / 13

13 — .00107 6

.00107 6

.000 6456

loss in 6 days = 6.5 mgs | alarm .7625 grs

" " " " = 13.5 " | 2.00 "

2 / 13.5

6.75

.7625 : 1 :: 6.75 : x

6.75 / .7625

J. P. Conant

Mar 17 /80

Plates for Meter prepared as follows.

---

unamalgamated but and unwashed in KOH but scraped bright (turned jet black in 15 minutes)

---

amalgamated without acid being washed in KOH and then in H_2O (poor result)

---

amalgamated by sol of sulphate-nitrate & chloride of Hg (washed in KOH + H_2O) (poor result)

---

amalgated with acid but washed with H_2O between dips and also after amal. (cleaned + KOH (medium)

Mar 17 / 83 continued

amalgamated + acid and washed after amalgamation. (four)

amalgamated with acid and not washed at all (four)

Tried to carbonize tragacanth in Zn Cl_2 but the carbon and gum were simply eaten.

J. P. Conant

Mar 19 /93.

wt of Plate = 14.634 gms +

Na_2SO_4 = 0.1500 "

stan. sol. – 300 c.c

---

wt of Plate = 13.649 gms 0

Na_2SO_4 = 1.000

stan. sol. 300 c.c

---

wt of Plate from Mar 8

wt (14) 12.4645 gms

wt (19) = 12.434

0.0305 loss in 5 days

.0135 " " 6 days

.0440 " " 11 "

Loss = 44 Mgs in 11 days

(over)

Mar 19 /83.

wt of Plate = 45.3975 gms
NH_4Cl = 1.000
Stan. Sol. = 300 c.c

Plate from acetic Mar 3,
Mar 3 = 45.6655 gms
" 19 = 45.3790 "
.2865

Loss = 286.5 Mgs in 16 days

286.5 gr | 16
17.90 Mgs per day
16
126
112
145
144
10

(over)

Mar 19 /83.

wt of Plate = 84.375 grs
NaCl = 1.000 "
Stan sol = 300 c.c.

wt of Plate = 85.6315 grs 2
NaCl = 0.500 "
Stan sol - 300 c.c

The action of the alum sol. seems more energetic when only a small quantity of alum is used, at first; but the stronger solution seems to have its action intensified by time

(over)

Mar 19 /83

wt of Plate = 80.744 grs
citrate caffein – 0.200
stan. sol. 300 c.c

Narcotin gave ppt.

Nitrate Strychnine = 0.200 grs
wt of Plate = 86.7435
stan sol 300 c.c

Veratrin gave ppt.

Weight of Plate = 78.004 grs Stan sol. – 300 c.c	To see if the solution attacks the plate

---

Prepared sulphosilicate of ammonia to try in meter

J. P. Conant.

Mar 20 /43

wt of Plate = 42.077 gms
citrate coffein = 0.005 "
stain sol. = 200 c.c

J. P. Conant

Mar 21 /13

Prepared solgulate of Potassium
for use in Meter but it was
of no use as it pptd. Zn.

J. B. Conant

Mon 22 /83

Tried to plate aluminium on brass using solution of sulphate of al and alum. result was only partially good

---

Same in alkaline sol and also alum alone gave no result.

Prepared a solution as follows.

al sulph - 20 grs

alum - 10 grs.

Water - 500 c.c.

J. P. Conant.

Mar 23 /83

wt of Plati = 15.15 - 3 grs
Piperine — trace
sol 300 c.c

Made experiment of
plating al on Cu.
(not very good result)

J. P. Conant

1,1355000 | 1.3925
1119000 | 815
21500
13925
75750
69625

1,135500 | 1,3925
111400 | 814
19500
13925
55750
55700

.82

.82

Mar 24 / 83

Ergotin (alcoholic sol.)

Appt. Zn and is N. G. for the matter

Spg of alcohol.

wt in air = 11.6425

" " H_2O = 10.250

" " EtHO = 10.489

11.6425
10.250
1.3925 wt H_2O

11.6425
10.489
1.1535 wt EtHO.

Mar 24 /80 (continued)

Plate from NH_4Cl of Mar 19 has lost nothing in weight.

J. P. Conant

Mar 26 /83

wt of $HgCl_2$ = 1 gms.

" of amal lead plate = 64.1855 gms

~~AD~~ distilled H_2O = 300 c. c.

The object of the above experiment is to determine whether or no a plate of lead amalgamated will either reduce mercury from or be oxidized by a solution of a salt of mercury, the aim being to obtain some metal which may be amalgamated, but which shall

(over)

Mar 24/83

be unacted on by a solution of mercury or a salt of mercury, and also be unacted on by the acid radical set free by the decomposition of such salt - The plate in question to be used as a carrier of mercury in a meter in which the quantity of current shall be measured by the quantity of mercury removed from the one electrode or deposited on the other.

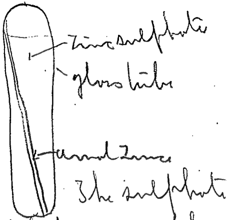
J. P. Conant

J. F. Ott

The hot solution caused the mercury to crack up destroying the smooth surface.

Mar 26, /13

Prepared the following experiment



The sulphate and plate were placed in the tube. The solution was then boiled and the tube sealed the object being to see if the plate would oxidize under these circumstances.

J. B. Conant

April - 19 - 83

Plate from Na_2SO_4, sol of

Mar 15.

wt Mar 15 = 77.872 ~~5~~
" . Apr 19 = 77.942
gain .070 ~~5~~

---

wt of Plate + from Na_2SO_4
of Mar 19 = 84.634
wt Apr " = 84.710
gain .076

Plate O from Na_2SO_4 of
Mar 19 - 43.649
Apr 19 - 43.714
gain .065

J. B. Conant

April 20 – 1883.

Plate in NaCl + of Mar 19

wt Mar 19 = 84.375

" Apr 20 = 84.420

gain = .045

Plate NaCl 2 Mar 19

wt (19) = 85.6315

" Apr 20 = 85.6820

gain .0505

Plate from citrate caffein

of Mar 19 = 80.744

wt Apr 20 = 80.790

gain .046

Apr 20 - 1880

Plate from strychnine Nitrate
of Mar 19 = 86.7435
on Apr 20 = 86.8855

gain .1420

Plate from stan sol of
Mar 19 = 78.004
Apr 20 = 78.073

gain .069

Plate from Citrate caffeine
of Mar 20 = 82.077
on Apr 20 = 82.136

gain .059

apr 20 1880

Plate from Reference cell

Mar 23 = 85.153

apr 20 = 85.204

gain .051

---

amalgamated Lead

Mar 24 wt = 64.1655

apr 20 " = 64.165

loss .0005

Resumé of Meter Experiment

Boiling the solution and covering with oil does not help matters in the least as in all cases tried there seems to be a reaction between the oil and the solution, the result of which is a deposit upon the plate.

This has been tried with the following oils.

olive oil	White thyme oil
Castor "	Tansy "
Cubeb "	Turpentine
Lemongrass "	Solution also
Wormseed "	covered with collodion which
Origanum "	dried and cracked

The placing in the bottle of other metals with a view to throwing the oxidation on to them, resulted in failure, for the metal was either unacted upon or else taken up by the solution and reduced on the plate.

---

acetic - tartaric - citric and phosphoric acids keep the plate bright but act upon it too strongly when present in sufficient quantity to be of service

---

Chromic acid is reduced by the Zinc

---

of all the other substances
tried the only ones that
promise ~~at~~ all are
~~$(NH_4)_2$~~SO_4 NH_4Cl
$NaCl$ – Na_2SO_4 –
Citrate of caffein – Pepsin,
which seem to keep down
the oxidation some what
without attacking the plate.

It was hoped that among
those substances ~~which~~ which kept
the plate bright, some might
be found whose action
would be constant but thus
far all seem to be uncertain,
the action being strengthened

by lime

The experiment of using different methods of amalgamation showed no particular result;

The best result so far as keeping the plate bright goes, is that obtained by boiling the solution containing the plate and sealing the vessel at once.

The plate of amalgamated [illegible] lead in $HgCl_2$ lost but a small fraction of its weight but as it seems to be covered with

reduced mercury it would appear that the neutralization has taken place at the expense of the lead plate. although ordinary tests do not show the presence of lead in the solution.

Thomas P. Conant,

June 9 - 1883.

Experiment on the weighing of zinc metre plates, the object being to devise a balance whose action shall be extremely rapid and which shall at the same time weigh within a few say 5 to 10 mgs. of the correct weight

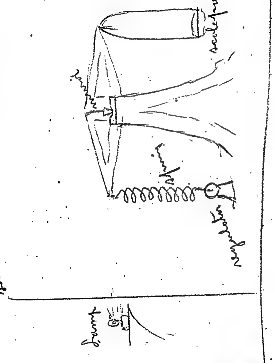
On Monday June 4 - 83 and through the week the following experiments have been performed:

The first idea was to use instead of weights, the tension of a spring and to read the deflection of the scale beam by means of a reflected spot of light

June 9 - cont.

upon a scale placed at any convenient distance.

The apparatus was put together as per sketch below.



June 9 cont.

The following springs of brass were tried.

No 1 =

Diam of wire = .030"

" " spring = $\frac{3}{4}$"

Length " " = 2"

No 2 = same as above with length = $2\frac{1}{2}$"

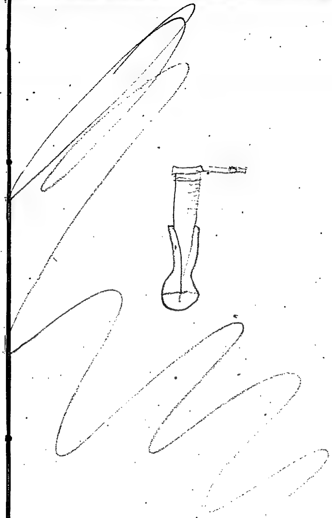
No 3 = ~~.054~~"

Diam of wire = .059"

" " spring = $\frac{15}{16}$"

Length " " = 5"

No 4 - same as 3 with length = $6\frac{1}{2}$"



June 9 - Cont.

N = 5

Diam of wire = .030"

" " spring = $2\frac{1}{2}$"

Length " = 6"

The trouble with all of these is that if a spring is sensitive enough to indicate a small weight say 10 mgs. a weight of 40 grms or a 25 light plate, will pull it nearly straight while on the other hand if the spring will sustain a heavy weight, the light weight will not affect it.

The size of the spring seemed to make very slight different and the only

June 9 - cont

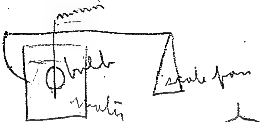
way to magnify the deflection would appear to be by increasing the distance from the scale to the mirror.

After this passes say three feet, it is difficult from the weighing chair, to see the scale.

With regard to weighing by the hydrometer, the same trouble occurs, that if the ~~[illegible]~~ hydrometer will show the effect of a light weight, a heavy one will push it out of sight.

June 9 - cont.

The apparatus would have been as follows.



showing mode of connecting bulb to lever.

The reason for getting under the bulb is that it is hard to guide it in any other way without an excessive amount of friction.

The idea would be to have the bulb closely balance the

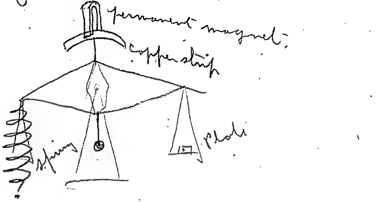
average weight of the plate and then ~~add~~ read from the scale by reflected light, the excess or deficiency with reference to the standard

~~The difficulty with~~ this, by calculation may be proved to be that already mentioned as it would not be easy to ~~so so calculate the average weight as to avoid~~ obtain a set of plates which after use would not show wide differences

Thomas P. Conant,

June 12 - 93.

Experiment to reduce oscillations of balance beam.



The magnet used was strong enough to lift a half pound piece of iron.

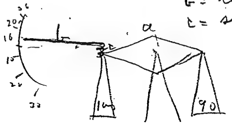
The effect was nothing, and the balance shook as badly as ever

J. N. L.

Began the construction of a balance on following principle. The weight to be suspended by a spring and the lever raised by hand there being an arrangement by which as soon as the scale pan leaves its support, the movement of the lever is arrested by an electro magnet.

Having noted the difficulty of using a spring between such wide limits as from 10 mgs to say 100 gms = 1 to 10000, it was determined to try the idea of throwing only a portion of the weight upon the spring. In other words, to roughly balance the plate by weights and obtain the fine reading by the spring.

a = beam
b = lever
c = spring

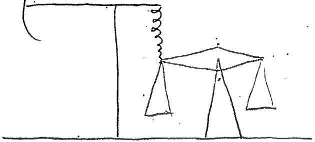


Thus in the preceding sketch, only the difference in weight will come upon the spring.

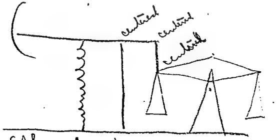
The experiment was tried and 10 mgs gave a readable deflection, the plate being balanced by weights to within 1 or 2 gms.

The experiment was repeated; using instead of a spring, a rigid connection between the beam and lever and if the plate be balanced to within 1 gm, the deflection indicate correctly the difference

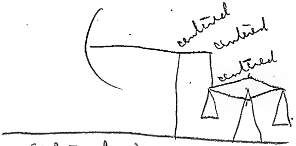
The following sketches show the various methods in which the experiment was arranged



unsteady



(Steady)



(steady)

a counterpoise was added to the ~~beam~~ lever to balance the bridge between it and the beam.

Thomas P. Conant.

June 21 - 90,

Tried spring of German silver & Copper.

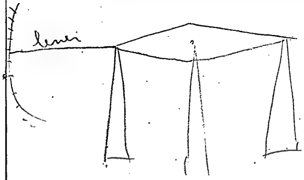
The German silver worked well but was not sensitive to small weights while the Copper made a poor spring

---

a spring of german silver wire 3" long and having a diameter of 3/4" gave with 20 grs a deflection of 7" but would show nothing short of 100 mgs,

June 21 cont.

Tried the following arrangement-



In this we do away with all unnecessary friction, and the lever showed from 1 gm to 10 mgs.. (lever 13" long) Lever of course being counterpoised,

Thomas P. Conant

June 22 80/

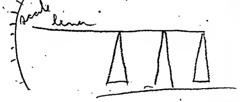
Tried electro magnet to damp oscillations of scale beam, using a strip of copper as before, but could notice no effect

Thomas P. Conant

$\frac{10}{1000}$

$\frac{5}{1000} =$

June 23 /80



Experiment repeated with above balance.

Length of lever from fulcrum $= 17''$

on the scale 1 gm gives a deflection of $5''$ - from which 10 mgs should give $\frac{1}{20}''$

By test 10 mgs does just this and hence the balance is sensitive even to 5 mgs

This is true up to a load of 40 to 50 gms but for 80-100

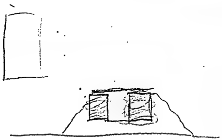
June 20/'13 cont'd.

grms the deflection for a given difference is ~~quite~~ smaller

---

When loaded with 4 25 light plates in each pan, 1 grm. gives a deflection of $2\frac{2}{4}$"

J. P. Conant



ref. air 11.6586
" H_2O 10,250
10503-
" EHO.

$10\,ZnSO_4 + 10\,H_2O$ | sol a

$10\,H_2O + \text{current} = 20\,\overset{-}{H} + 10\,\overset{+}{O}$

$10\,ZnSO_4 + 20\,H = 10\,Zn + 10\,H_2SO_4$

$10\,\overset{+}{Zn} + 10\,O = 10\,ZnO$

$10\,ZnO + 10\,H_2SO_4 = 10\,ZnSO_4 + 10\,H_2O$

$10\,ZnSO_4 + 15\,H_2O$ | sol b

$15\,H_2O + \text{current} = 30\,\overset{-}{H} + 15\,\overset{+}{O}$

$10\,ZnSO_4 + 30\,H = 10\,Zn + 10\,H_2SO_4 + 10\,H$

$15\,Zn + 15\,O = 15\,ZnO$

$15\,ZnO + 10\,H_2SO_4 = 10\,ZnSO_4 + 10\,H_2O + 5\,\overset{+}{Zn}O$

$5\,\overset{+}{Zn}O + 10\,H = 5\,\overset{+}{Zn} + 5\,H_2O$

$15\,ZnSO_4 + 10\,H_2O$ | sol c

$10\,H_2O + C = 20\,H + 10\,\overset{+}{O}$

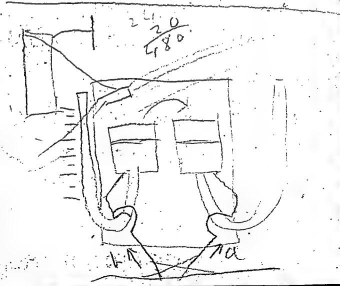
$15\,ZnSO_4 + 20\,H = 10\,Zn + 10\,H_2SO_4 + 5\,ZnSO_4$

$10\,\overset{+}{O} + 10\,Zn = 10\,ZnO$

$10\,ZnO + 10\,H_2SO_4 = 10\,ZnSO_4 + 10\,H_2O$

with xs of H_2O more oxide is formed on positive plate than can be taken up by H_2SO_4 formed

with xs of $ZnSO_4$ the action seems to be all right

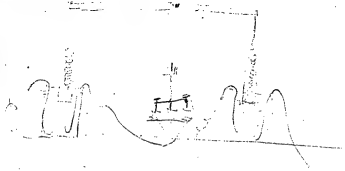


Menlo Park Notebook #145 [N-82-12-04]

This notebook covers the period December 1882-April 1884. The entries are by Edison, John Ott, Martin Force, Edward G. Acheson, George Gibbs, E. D. Kellogg, and H. de C. Hamilton. Many of the entries relate to carbon filament experiments and include notes and drawings of compound carbon filament lamps; carbons made from parchmentized paper, animal wastes, and foodstuffs such as flour, molasses, and gelatin; and chemical treating of filaments. There are also extensive notes and drawings of meter experiments, including meters using chemical paper. In addition, there are a few notes and drawings relating to safety catches, electro-vacuo experiments to produce gold foil for use in lamps, experiments on the absorption of materials, and battery experiments. The label on the front cover is marked "17th St & Ave B New York." The book contains 284 numbered pages.

Blank pages not filmed: 20-25, 120-121, 176-283.

Dec. 4th & 5th /82. George [illegible].
Experiments with Current Meters.



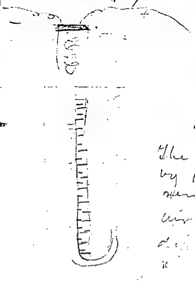
Tried exp with German silver
spirals arranged as shown
The spirals were placed under
~~on~~ inverted glass vessels which
were sealed in water [illegible]
The current [illegible]
coil heated [illegible]
the [illegible] and raised
the [illegible] raised the [illegible]
of [illegible]
[illegible]
[illegible] out of current for [illegible]

Dec 4 '85 — G.G.

first spiral and sent it — through siemens.
The external surface of these glasses is blackened to facilitate radiation of heat.

Solution Citrate Iron & Ammonia: — No success —

Dec 8th /82. George Gibbs,

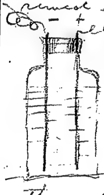


The coil was heated by passage of current — The expanding air in bottle and [illegible]

Dec. 21st/82. George Gibbs.

Experiments with Secondary Batteries.—

Made up a lot of small batteries of uniform size in following manner:— took two strips of lead gauge, 1/4 inch wide & 3 inches long; coated both with layer of red-lead, and sewed each up in woolen bag.



Placed them in small vial, as shown. Different solutions were introduced, and the batteries charged for same length of time. They were then discharged through a sounder, thus giving comparative tests.— The following were tried with small (?) quantity.

Time of charging — one hour.

Electrodes coated with red-lead

Solution, caustic soda —
no current.—

Solution Acetic Acid — Fair current

(over)

Solution, - Phosphoric Acid -
No current. —
Solution, - Hydrochloric Acid -
No Current. —
Solution Nitrate Lead - No
current. —
Solution (Na Cl) common Salt, -
no good. —
Solution Sulphuric Acid; —
Strong current, but runs down
rapidly, and entirely ceases
in 80 seconds. -
Solution Chromic Acid - —
Momentary current. N. G. —
Solution Chromic Acid with
Chromate of Lead on electrodes
- No good) - runs down very
quickly, —

Dec. 22nd / 82. Geo. Gibbs.

Secondary Batteries. Cont.

Electrodes with red-lead:—

Solution Oxalic Acid —

No current. —

Solution Arsenic Acid —

Little Good results – runs down in about one minute. —

Solution Acetic Acid. — Electrodes lead coated with Acetate of Mercury. — No current.

Jan 3rd —

Tried weak solution of KI, with two copper plates — n.g.

Jan 3rd /83. G. [illegible]

Electrical Deposit of Carbon on filaments.

Tried solution containing napthalin and hydriodic acid with little free Iodine.

This had to be [illegible] [illegible],

Did not work, the sol. was a non conductor of the current. —

Tried also, for same [illegible] [illegible], a sol. of bisulphide of Carbon, — does not work — a non conductor. —

Jan 6th Geo. Gibbs. ——

Experiments with absorption materials &c, to absorb oxygen from bulb & leave pure Nitrogen: —

Tried tube filled with blotting paper pellets saturated with a mixture of pyrogallic acid and caustic potash — (pyrogallate of potash). The exp was not a success, because air was absorbed along with the oxygen, thus giving too high reading (of amount of oxygen absorbed), in fact destroying the accuracy of the weighing device. Tried also suboxide of lead, obtained by igniting carefully oxalate of lead. The suboxide was moistened with wa—

(over)

from 5$\frac{10}{2}$ g. g.
when it rapidly absorbed
oxygen (theoretically) but
also <u>air</u>. this exp. failed
from the reason given
in last exp.

J.S.O February 3 1883.

Twisted Platinum fibre Lamp or rather Compound filament Lamp -

about 30 made & Exhausted so far; those having greatest number the best in fact 8 fibre filaments stand while the clamps melt from arcing - filament OK = Ends Copper plated & put in platinum Clamps, the resistance is such that one gives 10 candle which a 95 volt Lamp only

Came to yellow most
of them 5 c. p.
with 185 Volts,

Edison
M N Force.
J. F. O

Feby 3 1883

We find that the principle of
making a filament for the
Lamp Compound so that
Every Separate fibre is
Separately Expansible, is
Correct and that this kind
of a filament Can be made
Even & Cheap

Feby 3rd 1883 J.F.O.

The fibres (Manila) are twisted by a machine then the fibre doubles & allowed to twist on itself - hence it does not open in carbonizing - The Carbons of this kind Carbzd at lamp factory comes out remarkably even - owing to small mass & the high ... which these ~~...~~ filaments of carbon are intended to be worked at ... the ... of the filament

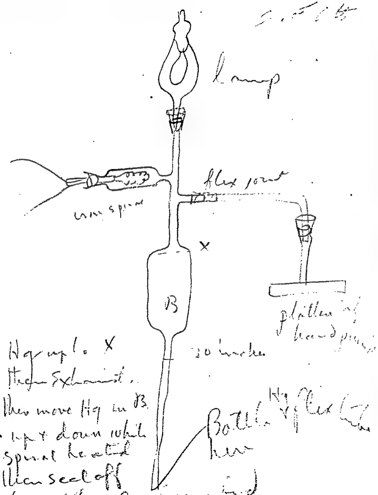
now the only remaining difficulty I have made a great number of Experiments on Low Vacuum in Connection with the Compound filament to Exhaust the Lamp to 27 inches & then seal off & absorb Oxygen by heating iron sponge wire coated with finely divided iron The oxygen oxidizing the finely divided

Feby 3 1883 TAE J.F.O.

ism, but we have not
succeeded in getting
rid of all the Oxygen
We are now Completing
a device for ascertaining
by measuring the weight
the Lamp + Spectrum
Wire tube so as to
[illegible]
by pumping all the air
to have accurately
the [illegible]

over

Feby 3 1883



Hg up to X
then Exhaust.
then move Hg in B
up & down while
spiral heated
then seal off
lamp when O [illegible]

July 2. 1883
M. N. Force
J. F. Ott

[illegible]

Experiment tried with chemical paper with the spark of an induction coil, for ampier meter to be used at central station

Iodid Potass wet Good mark but fades

Red Oxide Mercury wet Fair

Salt and Nitrate Silver & Fixed Good
dry

Nitrate Silver moist & Fixed Good

Salt & Nitrate Silver wet No Good

Iodide Potass dry No good

Salt & Silver Nitrate moist Fair
(Fixed)

Tanic acid wet Poor Mark

Acetate Uranium dry Nothing
+ Potass wet Nothing

Gum Dextrin — dry ,,
dry ,,
wet ,,

d

J. F. Ott July 2 1883
M. N. Fr

[illegible]

Amygdaline –	wet	Nothing
	dry	"
Gallate Ammonia	wet	Poor
Acetate Strontia	dry	Nothing
	wet	Good
	dry	Nothing
Acetate of Nickle	wet	Good
	dry	~~Nothing~~ Holes
Chloride Alumina	wet	Nothing
	dry	"
Citrate Magnesia	wet	"
	dry	"
Gum Guacum & Caustic Pot	wet	Good
	dry	No
Carmine	wet	Poor
	dry	No
Lacto Phosphate Bismuth	wet	No
	dry	"
Arsenate Soda	wet	"
	dry	"
Pyro Phosphate Natrium	wet	"
	dry	"
Benzoate Ammonia	wet	Fair
	dry	No

ED Kellogg J. Ott July 3 M. N. F.

1 Tart Acid J. wet Nothing
dry "

Salt & Silver Nitrate dried two days
fixed with salt — — Good.

Acetic Solution $KClO_3$ + Na Cl_2 + Co Cl_2
wet Nothing dry burns holes

~~"~~ Alum acetic wet Nothing
dry "

Red Oxide of Pb wet "
dry large holes

" " Co. Cl_2 wet No
dry "

" " Sulphate Lead wet "
dry "

" " Pb SO_4 wet "
dry "

" " Chloride Cobalt Salt wet "
dry "

" " Co Cl_2 x $KClO_3$ wet "
dry "

" " K_3 + Na Cl + Pyrogallic Acid
wet Poor
dry L. holes

" " Na Cl wet No
Poor holes

E D Kellogg J. F. Ott July 3 1883 M. M. F.

1 Salt + sesquioxide Iron + Pyrogallic Acid wet No dry No K I wet No

Pb S O4 Burned on paper

K I ———— wet Fair
dry L holes

Pb SO4 dry No

2 Tartaric Acid wet No
dry L holes

Acetic Solution Sesquioxide of Iron
wet No
dry "

1 " " Chloride of Cobalt
wet No
dry "

" " K3 + Na Cl wet Poor
mark fades
dry No

" " Iodide x Chloride Co + Na Cl
1 wet Good
but it fades
dry plain
holes

" " Salt Sesquioxide Fe wet No
dry Plain
holes

E D Kellogg July 3 1883 W. J. T.

Acetic Solution

Na Cl + K Cl O_3 J. F. Ott	wet	Nothing
	dry	Plain holes
" " K_3	wet	Good mark
	dry	holes but not plain
" " Chloride Cobalt Iodine	wet	No
	dry	Plain holes
" " Chromic Oxide + Salt	wet	No
	dry	plain holes
" " Chromic Oxide	wet	No
	dry	plain holes
" " Na Br	wet	No
	dry	plain holes
" " Na Cl	wet	No
	dry	plain holes
" " Chromate of R	wet	No
	dry	Plain holes
" " Soda Tartrate	wet	No
	dry	plain holes
Mn SO_4 + Alum	wet	Poor mark fades
	dry	Nothing

ED Kellogg July 3-1883

$KClO_3$ J. F. Ott wet Nothing
dry "

Protochloride Iron + Acetic Acid
wet No

Acetic Acid Sol wet No
dry plain holes

Protochoride Iron + Acetic Acid
dry plain holes

$(NH_4) + HS$ wet No

$CuSO_4 + Mn(SO_4)$ wet ~~No~~ Good
dry No

$Hg + C$ wet Poor mark
dry plain holes

$KSO_4 + Mn(SO_4)$ wet Fine mark
dry plain holes

Bromide Potash. wet good with Point in contact with Paper but poor without
dry - Holes

E D Kellogg J ~~FH~~ July 2 1883 M. Gt. T.

Tart. Magnesia wet Nothing
dry Nothing.

Nickel Sulphate wet Nothing
dry Nothing

Sesquioxide Iron wet - Nothing
dry - holes

Nickel Sulph. & Caust. Potash wet Nothing
dry Nothing

Bromide Sodium wet good with point in contact. dry Nothing.

Iodine ReSublimed wet good with point in contact. dry. Holes

Aniline Acetic wet good with point touching paper. dry Nothing

Niccol. Acetic wet ~~fine~~ very good
dry holes

J. F. Otto E D Kellogg July 3 1883

Nitrate Potash	wet	M. N. F.	very fine
	dry		very good
Extract Hemlock & Na Cl.	wet		very good
	dry		good
Bitartrate Potash	wet		Fair
	dry		Fair.
Bichromate Potash	wet		very good
	dry		very good
Nitrate Sodium	wet		good
	dry		good.
Phosphate Potassa.	wet		good
	dry		Fair
Ammonia Bichromate	wet		good
" "	dry		good.

J. Ott E.D. Kellogg July 5 1883 M.N.F.

Sulphuret Potassium	wet	Fair.
	dry	Fair
Microcosmic salts	wet	Nothing
	dry	Nothing
Niccol. Carbonic	wet	~~Nothing~~ Fair
	dry	Good
Iodide of Ammonia	wet	~~N~~ good
	dry	Good
Double Sulph. Copper & Ammon.	wet	Fair good with point touching Paper
	dry	Good
Bi-sulphate Soda	wet	Fair
	dry	Good
Carbonate Ammonia	wet	Good
	dry	Good
Manganous Acetate	wet	Good
	dry	Good
Boric Acid —	wet	Nothing
	dry	Good
Acetate Copper	wet	Good
	dry	Good

J. F. Ott EDKellogg July 3 1883

Sulphate Manganese	wet	good
Holes ~~~~ in a line	dry	good
Bromide Magnesia	wet	Nothing
holes in a straight line	dry	Good ~~~~
Prussian Indigo	wet	Nothing
Holes in a line	dry	good
Prussian Indigo + Na Cl	wet	good
	dry	Fair
Stanneous Acetate	wet	Fair
	dry	Fair
Chromate Potassa	wet	good
holes in a line	dry	good
Citrate Caffein	wet	Nothing
	dry	Good threads a little
Citrate Caffein + Na Cl	wet	Fair
	dry	Good threads a little
~~Chloride~~ Oxide Cobalt	wet	Nothing
~~strong~~ Holes in a line	dry	Good
Oxide Cobalt + Na Cl	wet	Fair
	dry	good Holes in line

J. F. Ott   E D Kellogg July 5 1883

Chloride Chromium wet Good
Holes in line dry Good

Gum Myrrh wet Nothing
dry Good holes in line

Gum Myrrh + Na Cl wet Fair
good with point in contact
dry Good holes in line

~~Nitrate~~ Cobalt wet good
dry good Holes in a line

Hypophosphate Iron wet Nothing
but good with Point touching paper
dry good holes in a line

J. F. Ott E D Kellogg July 6 1883

Sulphate Magnesia wet Faint
dry good holes in line

Nitrate Barium wet Good
dry Good holes in line

Protochloride Tin wet Good
dry Good holes in line

Yellow Ochre wet Nothing
dry Fair

[illegible] wet Poor (dim) sparks
dry very Fair

Oxide Tungstate wet Nothing
dry Good holes in line

Egg Albumen wet Good with Pt. touching
dry Good but holes spread a little

Blood Albumen wet good with Pt. touch.
dry Good but sparks spread a little

Antimonic Acid wet Nothing
dry Fair

Oxalate Cerium wet Nothing
dry Fair

Sulphate Copper wet good
dry Good holes in line

J. F. Ott July 1883

- Monochloride [illegible] wet Poor Mark / dry Good roles very straight
- Chloride Cerium wet ~~fair~~ good ~~with point touching~~ / dry Good
- Acetate Cerium wet good / dry good
- Lanthanum & Didymium Acetates wet good / dry Good
- Aluminium Sulphate wet good / dry Good
- ~~Calcium Nitrate wet good / dry~~
- Cadmium Acetate wet good / dry good
- Magnesium Acetate wet good / dry Good
- Zirconia Acetate wet good / dry Good
- Zinc Acetate wet good / dry Good

EDKellogg · J. F. Ott July 6 1883

Manganous Nitrate Good M. H. F.
dry Good

Chloride Zinc wet Good
dry Good

Cerium Acetate Good
dry Good

Acetate Lime wet Good
dry Good

EDKellogg July 7 1883
Aluminium Nitrate wet Good
dry Good

Sugar Alcohol wet Fair
dry Poor

Nitrate Ammonia wet Good
dry Poor

Barium Chloride wet Good
dry Fair

Stannate Soda wet Good
dry Fair

Calcium Acetate wet Good
dry Fair

Magnesia Nitrate wet ~~dry~~ Good
dry Good

g. F. Ott E D Kellogg July 7 1883 M. U. F

Cadmium Nitrate wet Good
dry Good.

Titanium Acetate wet Good
dry Good

Titanium Chloride wet Good
dry Good

Stannous Nitrate wet Good
dry Good

Aluminium Chloride wet Good
dry ~~very Fair~~ Fair

Aluminium Acetate wet Good
dry Good

Strontium Chloride wet Good
dry very Fair

EOKellogg J. F. Ott July 9 1883 M. M. F.

Uranine wet Good
dry Good

Zinc Sulphate wet Poor
dry Good

Silver Cyanide wet Fair dissolved in Ammonia
dry Fair

Saffron + Salt wet Very Poor
dry Fair

Acetic Sol. Cobalt Chloride wet Good
dry Fair

Acetic Sol Cobalt Chloride & NaCl wet Good, Finer mark than preceding
dry Good

Acetic Sol Cobalt Chloride + Chlorate Potash ~~wet~~ Good but wide Marks
dry Fair Holes far apart and di

Acetic Sol. Chloride Cobalt + Chlorate Potash + NaCl wet Good – Fine Marks –
dry Good Edges of Holes turn green but green fades away

Chlorate Potash wet Good mark ~~not~~ ~~wider than some~~ dry Poor – small holes –

J. F. Ott E D Kellogg July 9 1880 M.N.F

Chlorate Potash + Salt wet [illegible] good fine mark but not very black
dry Good but not very black holes

Sal Ammoniac wet Good mark
point must very close
dry Poor dim holes

Permanganate Potash Fine mark
color fades ~~but~~ does not dim mark any
dry Poor

Permanganate Pot. + Na Cl. wet Fine Mark
color fades little but does not dim the mark
dry Nothing

Sodium Tungstate wet poor - good
with Point touching Paper
dry Poor dim Holes

E D Kellogg July 10 1883 M. N. T.

J. F. Ott

Tried Cadmium Sulphate wet Fine mark vy black dry very Fair

Cadmium Sulphate + NaCl wet gives Good mark but not as black as preceeding dry it gives a good black holes but not in a very straight line.

Cadmium Bromide wet gives a dim mark dry Fair mark

Cadmium Bromide + NaCl wet gives Plain mark but not fine. dry Good black holes but not in straight line

---

Cadmium Chloride wet gives no mark at all. dry holes in a good straight line but not very black.

Cadmium Chloride + NaCl wet gives no mark except when Point touches paper. dry the mark is about same as in preceeding

---

Acetate Barium wet gives good plain mark but not regular Dry gives very plain holes but not in ~~on~~ a perfectly straight line

J. F. Ott July 10 1883
E D Kellogg M, W. F

Acetate Barium & Na Cl wet gives very plain & fine marks but not as black, or irregular as in preceding
Dry gives Holes but not as plain nor as straight as in preceding.

Nitrate Lead. wet gives good fine marks but in some places darker than others.
Dry very black holes but not in straight line enough

Nitrate Lead + Salt gives about same result wet but dry the holes are in a straighter line.

Cadmium Oxide wet gives no mark at all dry shows blackened holes but not straight line.

Cadmium Oxide + Salt wet gives very ~~f~~ plain marks but wide
Dry about same as preceding

Acetate Alumina wet gives nothing at all but dry it gives black holes in a crooked line

Acetate Alumina + Salt gives a very good marks when wet.
Dry about same as preceding

EDKellogg July 16 1883 J. F. Ott
M. N. Force

Cadmic Sulphide wet gave Plain mark but not fine or even
Dry: blackened Holes in ~~f~~ very fair line

Cadmic Sulphide + Salt wet.
gave very dark line but broad
Dry blackened holes but not as straight line as the other

Zinc Oxide wt gives plain mark
but very uneven dry it gives very good mark.

Zinc Oxide + Salt wet Good mark.
but rough dry good Mark

Precip Carbonate Zinc wet gives good mark but irregular
Dry Good mark

Precip Carbonate Zinc + NaCl gives very plain mark
Dry: Good plain holes and in very fair line

E D Kellogg July 10 J. F. O.

Iodide Cadmium wet gives fine mark dry also good mark

Iodide Cadmium + NaCl wet gives good mark also good mark dry

Citric Ammonia wet Good mark but Irregular Dry very good mark

---

Citric Ammonia + NaCl Good marks both wet + dry

Oxalate Lead wet gives no mark at all Dry it shows very good mark. Large black holes

Oxalate Lead + Salt wet. fine mark but not very plain.
Dry good mark. medium size holes

Carbonic Cadmium ~~wet~~ gives nothing till it partially dries off then current burns holes
Dry very good holes - large, black & in a line.

Cadmium Carbonic + Salt wet fine mark and quite plain ~~dry~~
Dry. very good mark large black holes in a good line.

Sulphate Calcium gives no mark till nearly dry then begins to make holes and when perfectly dry makes very good black holes

Sulphate Calcium & Na Cl. wet gives very good plain & fine mark
Dry Good large holes and black

E D Kellogg J.F.O. July 11 1883 M.N.T.

Sub Carbonate Bismuth wet gives ~~nothing~~ poor mark but as it dries off gives larger & larger holes till dry when it gives large, black holes and in very straight line

Sub Carbonate Bismuth + NaCl wet gives very good fine mark but irregular
Dry large black holes in very fair line

Carbonate Lead gives poor mark till nearly dry then very fair
Dry very large holes and in very good line.

Carbonate Lead + NaCl wet Nothing
Dry very good mark Holes large + Black

Caustic ~~Bismuth~~ Barium wet very plain mark but very broad
Dry large black holes in very good line

Caustic Barium + NaCl wet very fine mark + very plain
Dry medium holes + Black

ED Kellogg July [illegible] J. F. Ott

Oxalate Ammonium wet. Plain
marks but broad + irregular
Dry very fine large ~~black~~ black holes and
very straight line

Oxalate Ammonium + Na Cl wet
No ~~mark~~ mark except when point
touches paper then very good
Dry very fine marks holes larger
blacker + in a straighter line
than the one preceding which is very fine

Hyposulphide Soda wet very fine mark
but ~~very~~ irregular dry it makes
large black holes in very fair line

Hyposulphide Soda + Salt wet
Good fine line ~~&~~ but not unless
it is very wet.
Dry very good. large black
holes + very good line

J. F. Ott July 12 1883
E D Kellogg M. U. P.

Phosphate Ammonium wet gives very plain mark but very broad
Dry very large black holes in good line

Ditto + NaCl wet gives very good mark but uneven.
Dry medium holes. black + in good line

Oxalic Acid wet Fair mark. (wide + dim) Dry very good mark large black holes + very good line

Ditto + NaCl wet fine mark but not plain
Dry large holes in good line

Arcenate Copper wet. No Mark
Dry medium holes but very plain and in very good line

Ditto + Salt wet gives very fine and quite plain mark but rough
Dry ~~very~~ medium holes and very fair line

J. F. Ott July 12 1883 E D Kellogg M U.F.

Pyrophosphate Sodium wet
gives dim + broad line also ~~very~~
irregular
Dry Small holes + not very
plain but fair line

Ditto + NaCl wet, fine line but
very uneven + dim
Dry medium holes in very fair
line

Caustic Potash wet very plain
but wide + uneven
Dry Medium holes quite plain
and fair line

Caustic Potash + Salt wet very
black mark but uneven
Dry medium holes quite plain
and good line

Red Sulphuret Antimony wet
bluish tint to Paper but not very
plain + very broad
Dry medium holes + very plain
+ black

Ditto + NaCl wet fine white mark
very regular + plain
Dry large black holes in fair line

J. F. Ott July 12 1883 E. Kellogg
M. N. Fle

Arcinate Antimony wet gives No result at all & but dry it shows large holes plain but not very black & + fair line

---

Arcenate Antimony + Na Cl wet gives fine mark but scarcely perceptible except when point touches paper then there appears very good line

Dry about same as preceding excepting straighter line

Carbonate Copper wet shows nothing at all but dry there are very good holes + very fair line

---

Ditto + Salt wet very fine line but very irregular.

Dry large ~~holes~~ black holes + very fair line

Fluoride Calcium wet nothing

Dry medium holes dim but no good line

Ditto + Salt quite plain depression in paper also irregular fine line

Dry small holes quite black + very fair line

EDKellogg July 12 1883 J.F.Ott

Arsenious Acid wet 40 M U F
marks to all
Dry very small + dim holes
fair line f.

Ditto + Salt wet fine mark
but irregular
Dry very small holes dim
but good line

J. F. Ott July 13
M.N.F. EDKellogg

Oil Carui + Benzine dry
Poor mark - small dim holes

Oil Cubebs + Benzine ~~dry~~ very
Fair mark small but plain holes

Fusel Oil + Benzine dry very
Fair mark small but plain holes

Oil Wormseed + Benzine dry
very Fair small but plain holes

Oil Lemongrass + Benzine dry Fair
mark ~~dim~~ small but plain holes

Oil Citronella + Benzine dry Poor
small + very dim holes

Oil Tansy ~~dry~~ + Benzine dry
Poor small thin holes

J. F. Ott July 12 1883

E D Kellogg M N F

Tried saturating a piece of cloth with ink cloth fixed on drum and paper over it and passing spark through from drum to needle calculated to have sparks bring up with it enough ink to blacken edges of holes. did it very well but ink was apt to run through and spread over paper

July 16, E D Kellogg

Tried coloring linseed oil with red Lead + soaking cloth in same way but it did not work at all

J. F. Ott July 18 1883
E. H. Kellogg

Tried red Aniline & water mixed M. N. F.
a cloth fixed in same way as
preceding. It gave very plain
black marks but not due
I think to the aniline but to
the water making good conductor
for spark but poor for heat
so the paper was burned
Used brown Legal Cap paper

Tried also paper right on
cilinder without anything else
which gave very good marks
both when Legal Cap or thin
note paper was used

Tried also rapping drum
in cloth & putting nothing on
it then paper over it & Passing
spark through which
gave nothing at all
I then soaked ~~paper~~ cloth
in a solution of Caustic Soda
& it gave very fine marks as

E D Kellogg, July 18 18[illegible]
good as first one on page 99

J. F. Ott

Aug 27. 1883

Boiled Linseed oil to thick paste then disolved in, Carbon, Bisulphide, Chloroform, Sulphuric Ether, and Benzole covered tissue paper stuck together dried and carbonized

J. F. Ott

Sep 5. 1883

Parchmentized tissue paper then washed dried and pasted together with Gum tragant which gave very good results

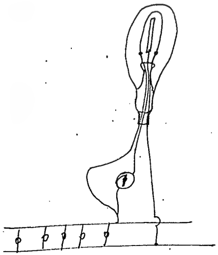
Sep 5, 1883

Parchmentized tissue paper laid on top of each other and left lay for several hours then washed and dried and found it a solid mass

Oct 8. 1883

J. F. Ott

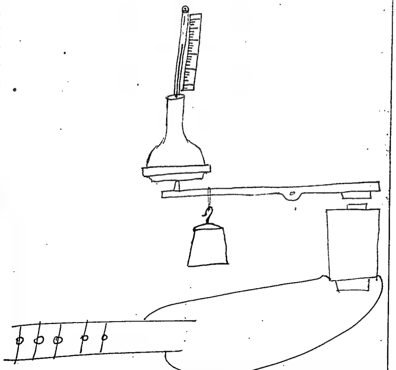
Mr Edison ordered a working model made to indicate pressure ~~across~~ thel line, acording to sketch given to me dated Oct 8. 1883. Sci. Book No 204 page 67



Oct. 8, 1883

J. F. Ott

Made working model to indicate pressure on line after following manner



Oct 15, 1883

Parchmentized tissue paper pasted together before dryed with Gum Tragant, heated and Air dryed and found they adheared together without slightest flaw in it.

J. F. Ott

Oct 22. 1883

Baught and tested different kinds of paper and found the English the best. it being more even in its structure.

J. F. Ott

Oct. 83.

Parchmentized tissue paper put them on top of each other, then put under preasure and heated, and found them stick together

J. F. Ott

Nov 22. 83.

Parchmentized tissue paper fastening them together with Gum Tragant by subjecting them to preasure and heat when dry pumicedstoned them of smooth making the sheet a perfect even structure

J. F. Ott

Nov 22. 1883.

Made several sheets with 10. and 11. sheets on top of each other uniting them together as one sheet and sent to lamp factory to ~~mak~~ cut up into filiments and put in lamps

J. F. Ott

Nov 23. 83

Disolved Resin in Achol and imassed parchment strips and fastened together,

Also the unparchmentized strips. by subjecting them to pressure and heat

Also disolved boiled Linseed oil in Eather and fastened sheets together

Also dissolved Resin in Bengine

J. F. Ott

Volts and resistance (3) Three of the lamps mad of parchment paper Carbons at 16 Candles

Volts	Res	Foot lbs	Amp	Lamps per H.P.	Cndl [illegible]
132.5	242	3206	.589	10.29	165
126.5	237	2989	.534	11.04	177
129.5	239.1	3079	.561	10.66	171

Size of Carbon 6" $\frac{3 \times 20}{1000}$

Life of each lamp at 64 candle power

No	Min
1	10
2	20
3	55
4	75
5	90
6	90
7	95
8	95

this test made at Lamp factory J. F. Ott

Plated Lead safty catches for street mains by drilling small holes in then plating them with copper making a perfect contact without riviting plates on

J. F. Ott

Dec. 7 1883
J. F. Ott M. N. F.

Made a solution of resin and alcohol immersed a piece of bamboo paper in it drying the same in the air after drying pressed it for the purpose of making a carbon filament. Sent to lamp factory to be carbonized.

Also made sol. of turpentine and resin for the same purpose pressing it after drying

Also one of gum tragacanth and ammonia pressing after drying

Dec- 10 1883
J. F. Ott

Made a boiling solution. alcohol sugar and water: immersed bamboo paper leaving it in for about fifteen minutes to get the solution well through it. then took it out and let it dry in the air after drying I then pressed it and sent it to lamp factory to be Carbonized

---

Also made sol of gum dextrin and one of starch

Dec 21, 83

Stoped at lamp factory and called for bamboo paper that were carbonized, and discribed on page above

J. F. Ott

Went to slaughter house to get samples of horn bladder and Intestines Grissel, softened them in Linseed Oil, and pressed them in sheets then cut them as samples to send to Lamp Factory to be Carbonized

Dec .83,

J. F. Ott

Made solution of the following ingredients for the purpose of making Carbon fillments from

Glue and Gelatin

" " Charcohl

Glue and Gilatin and Charcoal

" — " Burnt Sugar

" — " Flour —

" — " Dextrine

" — " Resin

J.F.O.H. Dec. 24, 83.

Mixed Gum Dextrine & Flour

Flour Water and lamp black

" — " " Burnt sugar

" — " ————

" — " and sugar sol sat

" — Glue water

" — Olive oil

Gum Tragacanth

" — Water Charcoal

" — Plumbago

" — Drop black

Flour — Collodium

Flour and sat sol of Glue

" Kerosene and Resin

" Pearl Sago gummy

" Fish Glue gummy

" Linseed oil

" Glue water & sat Sol

All compounds up to present ~~time~~ containing oil make them brittle

Dec. 28, 83,

Also Lamp black, Drop black, Plumbago,

Dec, 28, 83

Flour Cocoa butter

" Milk sugar

New York Jan 4 1884
M. N. Force

Tried the following ingredients with (Starch as a base) for the purpose of making carbon filaments.

Sol. Starch gum tragacanth and glue water, poured out in sheets and left to dry. This was no good

---

Sol. Starch tragacanth & gum arabic. poured in sheets. this also was. n.g.

Starch sugar and flour boiled together into a thick paste or dough then rolled into sheets, and filaments punched from them. this worked very well

New York Jan. 4 1884
M. N. Force

Molasses & flour boiled together into a thick paste then rolled into sheets, and filiments punched from them, this also worked well

---

Starch and gum tragacanth boiled together, flour added after to thicken to a dough then rolled into sheets, and filiments punched from them. this made very fine sheets

---

Jan. 5 1884
M N Force

Starch and gelitin boiled together and made into a dough and sheets made from this also and filiments punched from it

New York Jan 5 1884
M. M. Foren

Starch boiled, gum tragacanth addded then thickened to a dough, with powered starch This was no good as the pwd starch made it to short same as when mixed with oils

---

Starch gum tragacanth and flour mixed cold. to a dough. Then rolled into sheets and filements punched from it. this also made very fine sheets and filiments

---

Sol. Starch and sugar poured into sheets Left to dry this was no good

New York Jan 5 1884
M. N. Force

Starch sugar and dextrin boiled to a thick paste rolled into sheets and filiments cut from it. also a paste made of starch and sugar. both worked very well

Jan 7. 1884 M. N. Force

Starch powdered pearl sago and flour mixed to a dough then rolled into sheets and filiments cut from it.

Starch pearl sago flour and sugar made and cut into filiments.

Sol., Made from both but like all others where no good.

New York Jan 9 1884
M. N. Force

Starch gelatin and a minimum amount of molasses or syrup boiled together and thickened with flour to a dough. then rolled in sheets to .003 in thickness and filament punched from it.

New York Jan 9" 84

Made filaments from the different combinations & sent them to lamp-factory for carbonization.

Edw. H. Hamilton.

Jan. 14" 84.

Starch, pearl-sago + molasses mixed together + poured into sheets; it keeps very plyable. Hamilton

Hamilton Jan. 15" 84

Starch + arrow-root boiled together + poured into sheets; very clear when dry but also very brittle.

ditto - ditto plus tragacanth; same result.

Jan 15: 84

Starch + arrow-root boiled together + thickened to a dough with flour, then rolled out in sheets + filaments punched from it. Hamilton

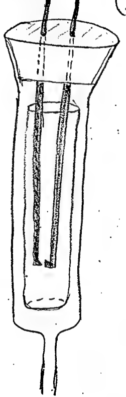
Hamilton. Jan. 17" 84.

Starch + arrow-root boiled together + a small amount of molasses mixed in to keep it from getting brittle; poured out in sheets it kept ply-able for 8 or 10 days.

New York Jany 10 1884
M N i Bre

For producing Gold Foil by Electro-vacuo deposit —

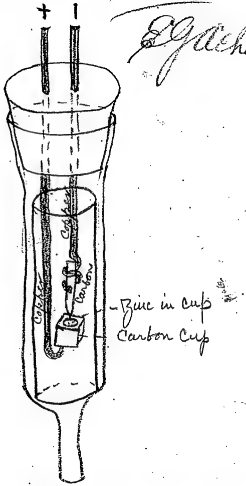
(+) 1 +0 (Copper rods with Gold points)

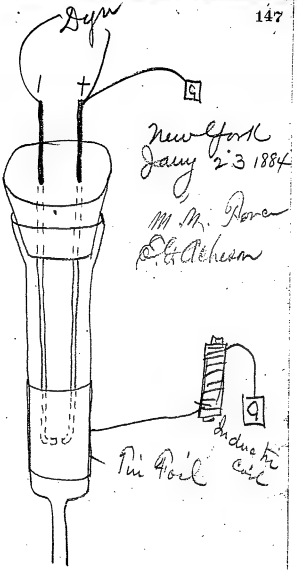


New York Jany 11 1884

Wm. M. Rea

E G Acheson



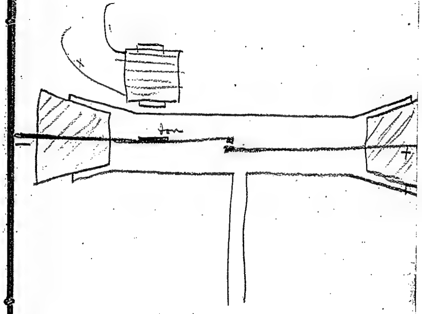


New York
Jany 23 1884

M. M. Rowe
E. G. Acheson

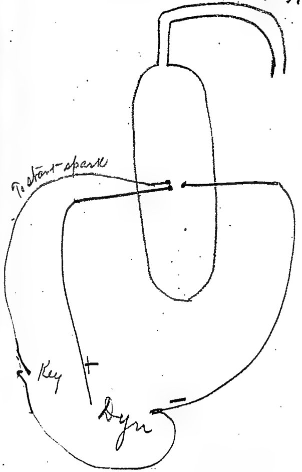
New York Jany 30 1884

E.G. Acheson
M N Force



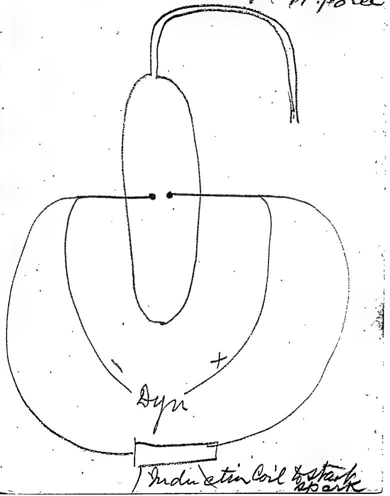
New York Jany 31

E G Acheson
M A Force



New York Jany 31 1884

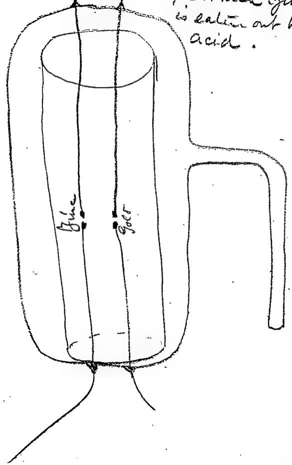
Ed G Acheson
M. N. Force



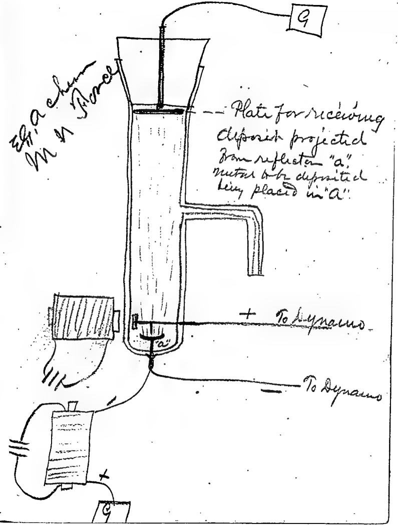
New York Jany 31 1884

For depositing alternate layers of Gold and Zinc after which Zinc is eaten out by acid.

E G Acheson
M N Force

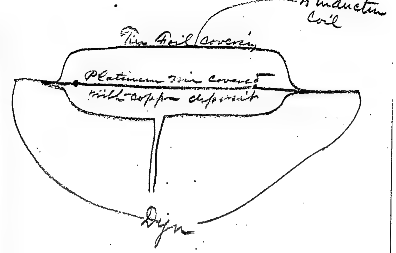


New York Jany 31 1886



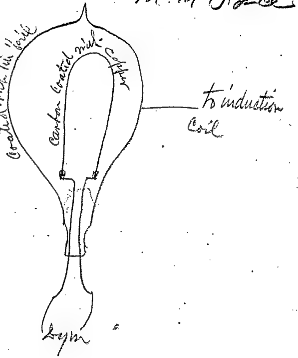
New York Feb 2 1884

M N Force



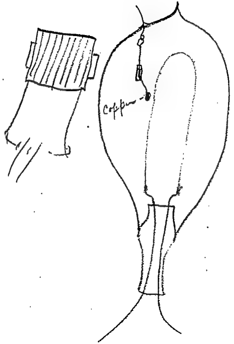
E G Acheson

E G Acheson
M. N. Force



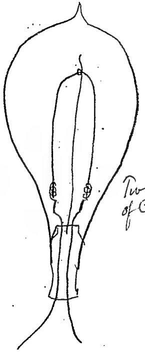
New York Feb 5 / 1884

E G Acheson
M G Force



New York Feb 5 1884

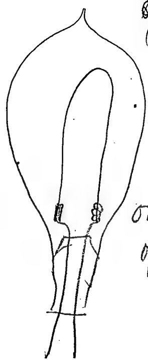
E. G. Acheson
M-N Force



Two loose clamps
of Copper

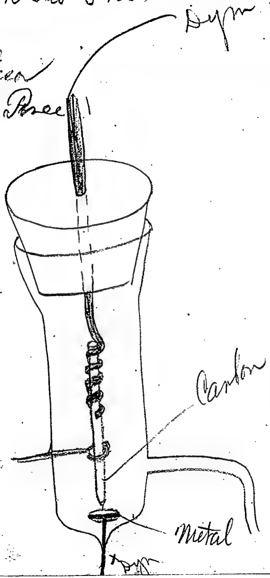
New York Feb 5 1884

E.H. Johnson
M N Force

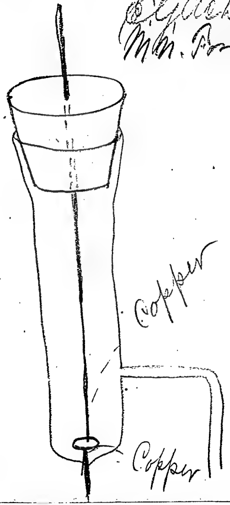


New York Feb 6 1884

E G Acheson
M N Force

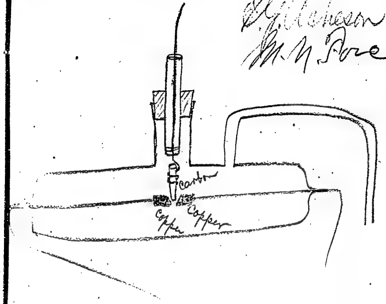


New York Feb 6 1884



O. G. Acheson
M. N. Force

E. G. Acheson
M. N. Force



HYGROSCOPE →

New York Apr - 11 1884

Martin N. Force

Experiments on combinations of different substances for the purpose of making carbon filaments

Magnesia Oxide & Gelatine
" Chloride " "
" Acetate " "

April 5 1884

Dried film tragacanth are marvelously sensitive to moisture finger 3 inches away throws it into violent contortions apply it to Hygroscope - TAE

M N Force

Menlo Park Notebook #146 [N-79-02-20.2]

This notebook is undated but was probably used in 1880 or 1881. There are entries by Edison and probably by Charles P. Mott. The material was copied from other notebooks, which were probably used in patent interference cases. A number of entries give references to specific interference cases. Included are notes and drawings of carbon filament lamps, vacuum pumps, and dynamos. In some cases, a date has been assigned to material that was not dated in the original notebook. The book contains 284 numbered pages.

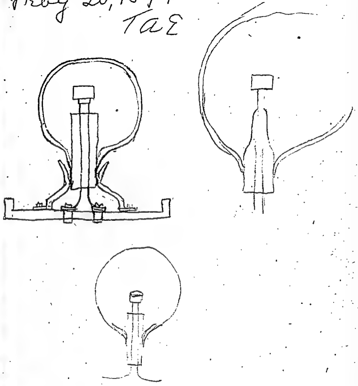
Blank pages not filmed: 18-19, 46-47, 78-79, 110-111, 142-284.

Missing page numbers: 129-130.

Vol 26, page 65

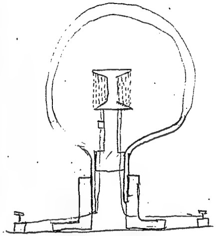
1

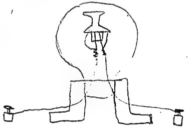
Feb'y 20, 1879
TAE



Vol. 20, page 1

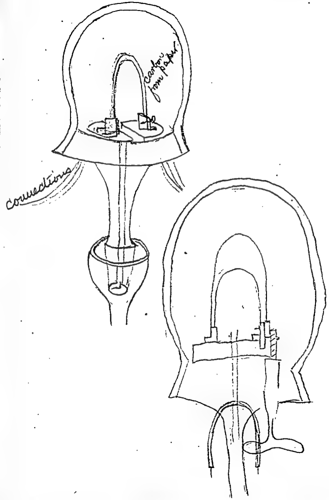
Feb. 24, 1879



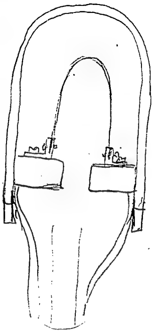


Mch 29, 1880

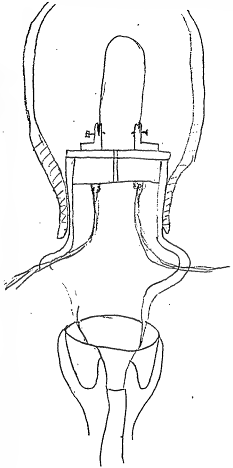
Carbonizing in Vacuo
Chas. Batchelor



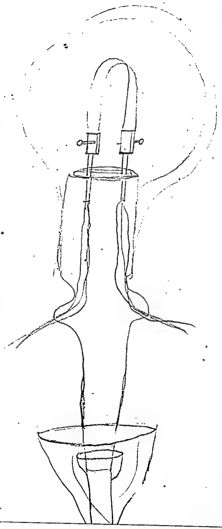
Vol 57, page 4



Vol 51, page 7



Vol 51 page 9



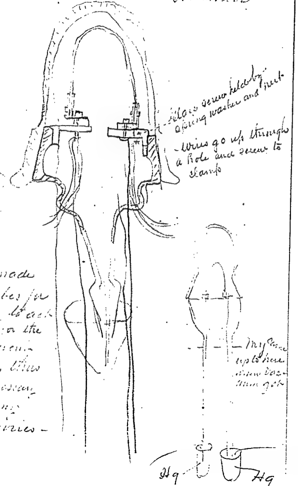
Vol 51 page 11

Carbonizing in Vacuum Mch. 29, 1880

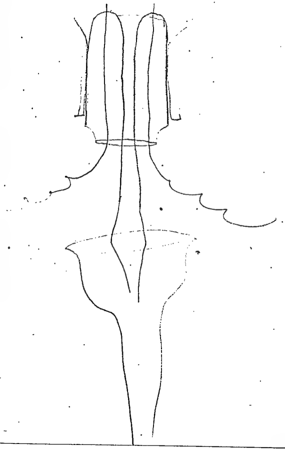
Chas Batchelor

Made by
Batchelor
C Bohm
C. Dean
M. Force

This was made with two tubes for the mercury to act as conductor for the wire which were dipped down, thus it was necessary to seal in any platinum wires -



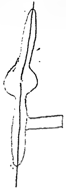
Vol 57 Page 15

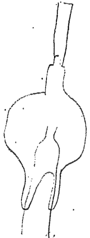


Vol 22 page 29

March 20. 1879

TAE





Clamp wire

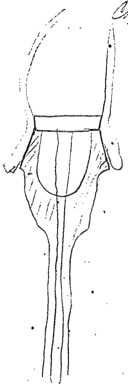
3 $\frac{20}{1000}$

twisted together

Vol 57 Page 83

March 30. 1850

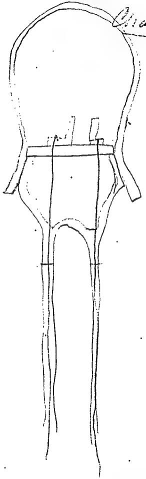
Chas Batchelor



Vol 57 Page 87

Mch 30, 1880

Chas Batchelor



Vol 85 Page 97.

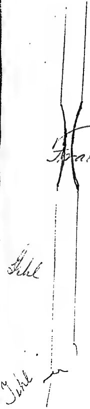
Drawing of a pump - dated
Oct 2d 1879 signed by S. D. Mott
and T. A. Edison

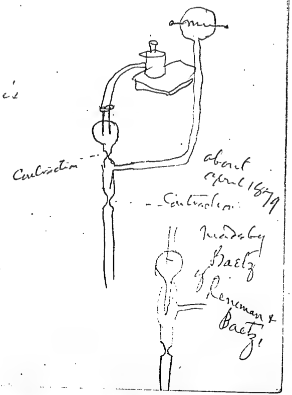
References for Bohm's Interference

Contraction integral with mercury fall tube.

Book No. 68. page 27.

April 15th 1880

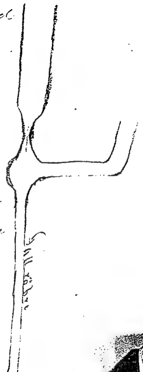




Book No. 68. page 33

April 16th 1880

Airpump devised by Francis and Upton



Repair
meen on airpump
this has made new in
the morning

/// repaired
McLeod gauge broken
on pumps marked 4.

 Book 68.

Page 42

Sketch on page 43 shows a device of a Sprengel pump in which McLeod gauge tube and fall tube are one tube, Fig a shows first device. Fig 2 shows second device. Fig a was devised by Dr Moses. Modification shown in Fig 2 was devised by Böhm

Book No. 68. Page 43

April 20th 1880.

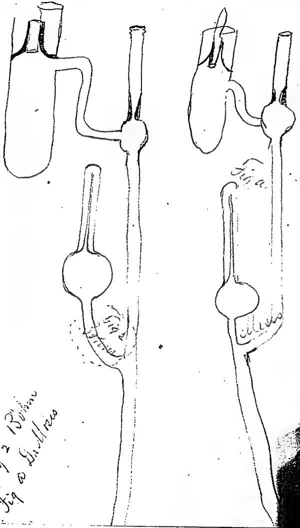
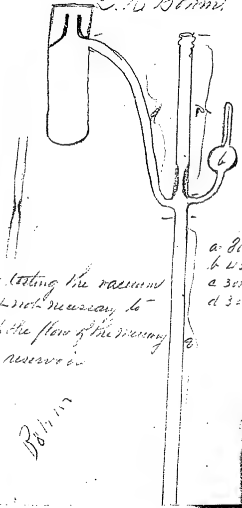


Fig 2 Böhm
Fig a Dr Moses

No. 68 page 45.

April 21st 1880
G. K. Boehm



a 800 m m long
b 45 " " in diameter
c 300 " " long
d 30 " " "

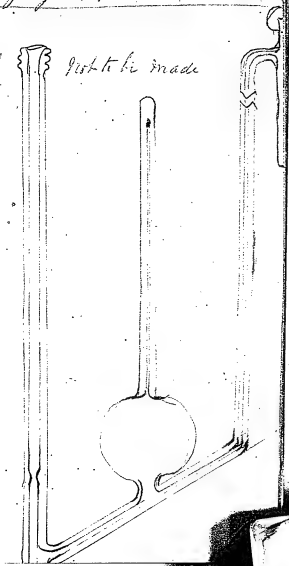
for testing the vacuum is it not necessary to stop the flow of the mercury the reservoir

Bohm

No. 68. page 49.

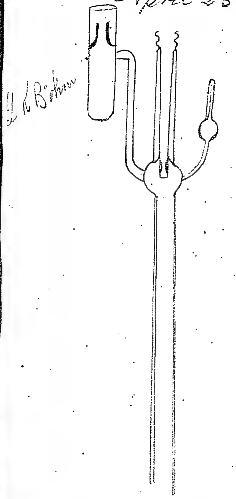
Dr. Moses

Not to be made



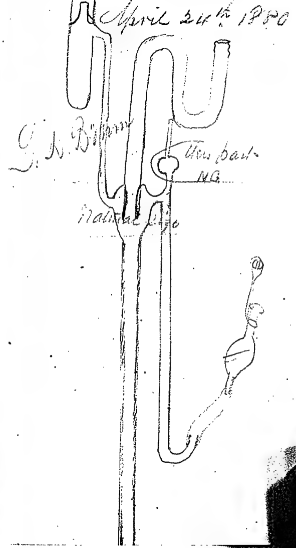
No. 68 pge 58

April 23rd 1880



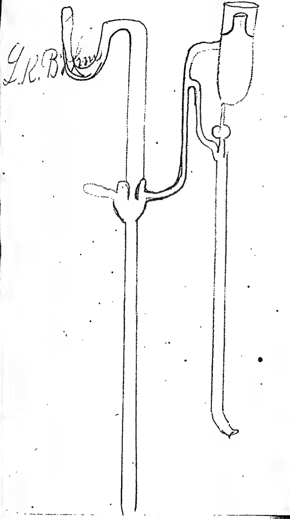
No. 68 page 57

April 24th 1880



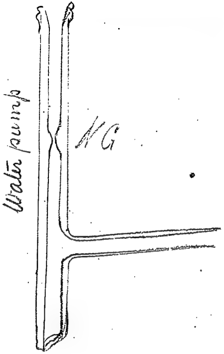
No. 68, page 63

April 26th 1880



No. 68. part of page 65

Dr Moses



No. 85 pages 97 & 99

Has complete drawings of Mercury pumps marked respectively No. 3 & No. 11. In the latter the contraction is shown and referred to in writing on opposite page by Mr. Upton.

See also scrap book on Vac Apparatus

References for plate carbon.
(Weston vs Latimer vs. Edison

Note book No. 21 page 163 (part)

Covered bars of carbon with copper film deposited by electrolysis, then exposed to fumes of sulphur to convert the copper film into sulphide, by this means obtained bars of carbon coated with films of copper sulphide.

(Lawson writing, probably Octobr 79)

Book No. 41 page 141.

730	290	160	July 21	Large Loop copper plated on shaft of carbon

Book No 41 page 185.

800	226	meh 6	6	The clamps [illegible] and broke the carbon. High Vacuum. Small loop copper plated 010 Paper pressed to 007

Book No 41 page 187.

No of Lamps	Before plating	After plating	Date	Lamp	Notes
806	—		—	—	Small loop copper plated 015 Paper pressed to 007. Broken in clamping
807	300		meh 6	6	Small Loop copper plated Pressed to 007 Small crack on the inside globe could not get a vacuum

Book No. 41 page 187.

808	8,000	6,900	Mch 7	6	one fibre of [illegible] with copper ends.
809.	250		7.	6	2 small Forks .015 [illegible] paper pressed to .007 on as copper plated.
810	259		7	6	Same as above

(Book No. 41. contains record of lamps up to No. 973, the larger part of which are described as of copper plate ends)

54

Book No 57 page 5

55

Lamps

March 8th 1880
Chas Batchelor
M N Force

841 Carb 132, Book 70
Manilla fibres .007 thick, boiled
copperplated,

842 Carb 129. Book 70
Palmetto leaf fibre - copperd

843
844 Palmetto leaf copperd.

845 Carb 145
Two strands

846
847 Wire grass from Florida
copperd

Bad [illegible] at top.

Book No 57 page 9 - (part)

Lamps.

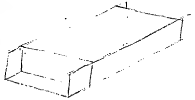
848
849 Palmetto leaf dry copped

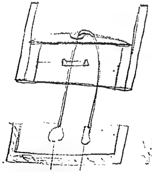
850 Small loop soaked in
851 starch and H.2.O. and
852 pressed carbon.
853

854 Palmetto leaf
855 coppered
856

(Large portion of Book No 57 devoted to carbon lamps with frequent descriptions of "coppering" by Mr. Batchelor

Book No. 125, page 149





for heating the cushion
in case,

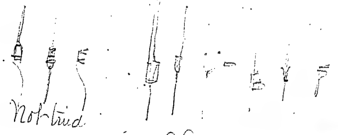
Book No. 125 page 163.

Dec 18 Different Ways for clamping Carbons for plating

Edisons suggestion

Unsatisfactory.

Edisons Sug.



Book No. 70 page 162.

Lamps — Feby 23. 1880 Chas Batchelor

727 Carb Exp 74 — Bast fibre — Paper ends soaked in thick sugar

728 Large loop — New sugared sol - high R. 312 ohms —

729 Large loop — sugared with No. 2 solution

730 One large loop dipped in

Mch 4, 1880

Make thin bass fibres coated with plumbago and sugar and copper plate the ends

Have Geo. copper plate the carbons

(Batch's writing)

806

This I found broken in glass house
I think by not washing
[illegible] the copper plating solution it had
~~[illegible]~~ broken out where the deposit made
C. B.

Book No. 70 page 187

Lamps Mch 6th 1880

805 small loop copper plated
15 m - paper pressed to 7 m
clamps heated on pumps and
busted

806 Small loop - copper plated -
— x .015 paper pressed to .007 -
Broken in glass House

807 Small loop - copper plated
.015 paper pressed to .007
small crack on inside globe
cannot get vacuum

808 One fibre of jute with
coppered ends
8000 ohms

(Batch's writing)

No. 70 page 190.

Lamps 2 small loops - 015 - manila
809 } paper pressed to 007 - ends
810 } copperplated

811 Manilla fibre - ends copperplated
812 - Carb cap. 122 -

813 3 small loops 015 manila paper
814 pressed to 007 - ends copperplated
815

816 Jute (fibres) number -
- (Carb 126) copperplated.

(Batch writing)

(to lamp No. 810 and near end of book a number of lamps are described as plated)

Book No. 104. page 1

E.D.1. July 5 1880

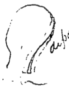
Made a very diluted solution of nitric acid got six elements of Bi chrom battery, made took a paper car. in clamps and put the battery on to it it being first put in the solution, In the evening I went to look at it, I found that it was broken how I dont know, I noticed that one of the clamps was black, I put a new carbon in again

(2) And set the battery to work again on it In the morning (July 6) I took at it again and there was a thick deposit ~~on the~~ on one of the clamps (the zinc end)

No 1011 page 3

Ep 2

Made a diluted solution of copper sulphate & took a carbon in clamps and put it into it and put one cup of Daniels on it, let it worked all night and in the morning there was a deposit on the carbon as shown in the



figure

I also have succeeded in plating these ends with copper nickel & other metals, which serves to make excellent contact between the clamps and the ends, I effect the deposit by hanging the loops upon a wire which is connected to one pole of a battery & allowing the ends of the loops to dip in the plating solution the proper distance, the jar containing the plating solution being in contact with the other pole of the battery -

(Mr Edisons writing)

(Copied in Caveat Book about Feby, 80)

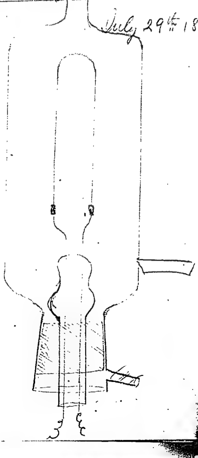
From Mott's Record. Mch 15:80

Geo. Carman plating loops in the Laboratory — from same Dec 17 to 21 plating commercially at the Lamp factory —

References on Equalizing the Resistance of carbons Maxim vs Edison.

Book No. 68 page 175

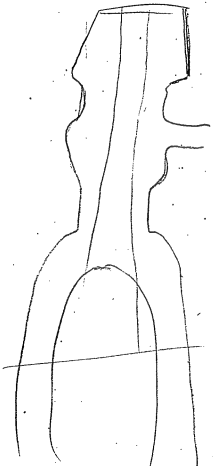
July 29th 1880



Part No 1 of carbon test-app natural size too large C. H.

B

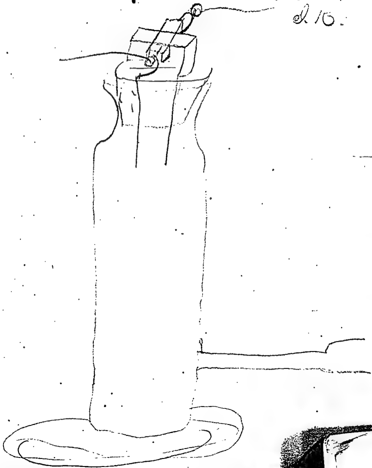
Book No. 23 page 80½



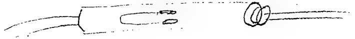
(No date in page. previous and subsequent dates in book Feb 22, 79).

No. 22 page 27

March 20. 1879
T.A.E.
&10.



Book No. 42 page 51 (part)



passing vapors of Hydrocarbons
or carbonizable gases through
Hot tube to build up by deposit

(Mr. Edison's writing, probably Jany
or February 1880)

Lamp No 1323 July 24. 80

Heated to white in Kerosene

16 candles

107 = D.

35.6

12.58 ohms

67.5 inches

126 = D

4

5.41 6290

3800

10.090 Ohms

5.55 Took off current

No. 112 page 39

No 1323

80
26 3/4
5 3/4

1 a E

Kerosene oil lamp.
8 candles

937

65 1/4 inches

134
1111,6

6290
2150
8.440

No 112 page 41

No 1323 Thos A Edison
July 26. 1880

248 Could not measure
very easily but
estimated 350 candles

7.2 ohms

160

53.3 Volts

10-1 Went at top of carbon
13 minutes

Book 112 page 43

Bast No 1324

Incandescent for a short time in oil T. A. E.

Book 137 p 53

Resistance cold 135.4 ohms

16 candles

86.9 ohms

716 volts

2620 ft. lbs.

12.5 per H. P.

Book No 112 page 45

No 1326 July 26, 1880

3.2 48 candles T.A.E.

6290
6290
3720
11620
51.5 ohms
83.3 Volts
3760 ft lbs
8.75 per H.P.

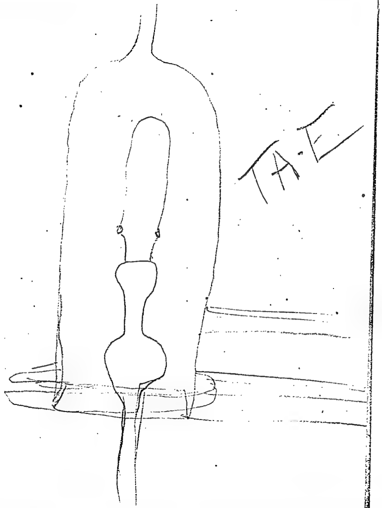
3.37 ~~[illegible]~~
Stopped machine

35 minutes

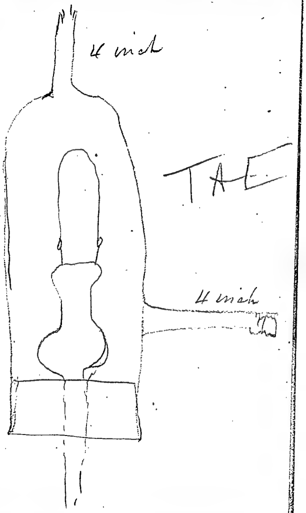
Page 47

No 1324
4.53 Started T.A.E.

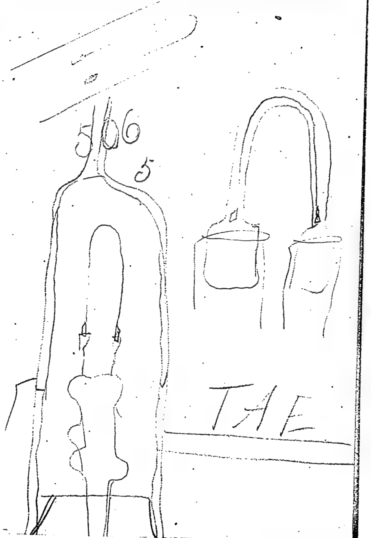
Book No. 112 pge 280



Book No 112 page 281



Book No 112 page 283.

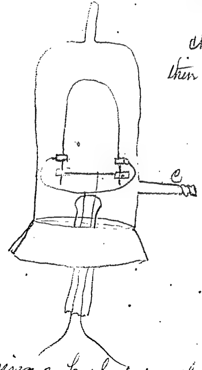


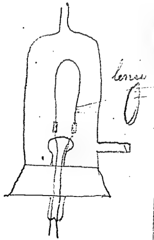
Patent

Oct 25 1880

T.A.E.
Chas Batchelor

chlorine first
then a volitile parafine

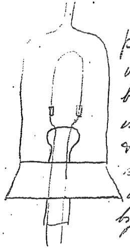




Using a heliostat on the arc,
Tar may be put on at lower end & focus put on it

Caveat Oct 25, 1880

T.A.E.
Chas Batchelor

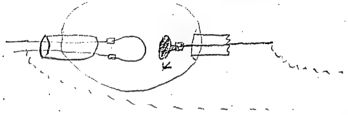


platinum nickel cobalt or other infusible metal brought to incandescence in a carbon vapor & carbon deposited it is then stripped off or it may be loosened by eating the metal,

Book No. 60 page 4.

Caveat

Oct 25, 80
Chas Batchelor



Induction spark and heating loop same time - vapor of volitile parafin in tube or carbon X soaked in tar -
Electrical carrying cools carbon

Carbonize under pressure

See Exp Research 5 page 132.
Date previous to Feby 1. 80

References for Field from separate sources of electricity — and Regulating the field by Resistances etc.

Book No. 4 pages 105 + 107

"The Gramme machine was then used to run the magnet and a fearful pulling was the result as nearly all the currents were short circuited" ——

"Ex. No. 52 Feb 16. 1879
With one man power, Martin,
a fair arc could be obtained
from carbon points, a foot
of .001 In. It was heated.
The commutators were connected
so that the current had to pass
through four coils, Large
sparks were obtained outside
the battery being used to make
the field magnets"

Book No. 4 page 111

"Ex 53.

The battery current was put from the top to the bottom commutator side of the Gramme and the ring revolved. No current or very little from the sides. Perhaps if the battery current were sent through at different EMF it would work"

Book, No, 8, page 219

"Ex Put the Gramme ring in the Magnet and test its EMF also without Magnet in circuit.

No Ey ".

Exp. Research 5 page 98

Caveat dated March 17, 1879

"B is the field magnet which may be supplied with energy from the ring a or from an exterior source"

Page 101-
"The operator now watches the Galvanometer and commences to insert resistance until the power of the magnet is so weakened" &c

Page 102. Suggests turning the brushes on the commutator to govern the strength of the circuit

Exp Research 5 page 107.

Caveat Aug 7 1879

Mentions several ways & means of governing the electromotive force of machine.

Page 128

Caveat dated Dec 19. 1879

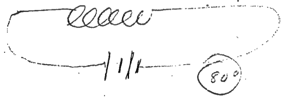
"For energizing the field magnets of the subsidiary generators & for a dynamo electric machine, the current from which passes through the field magnets of all the subsidiary generators either in series or in multiple arc, in this circuit I place a large number of resistance coils of large wire and subdivided so that each has say 1/50 of an ohm, a wire between each resistance coil leads to a rotary commutator which in turning short circuits a greater or lesser number of resistance coils, thus increasing or decreasing the strength of the current in the field magnets etc

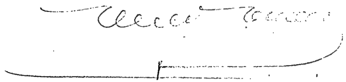
Note Book 12 page 11

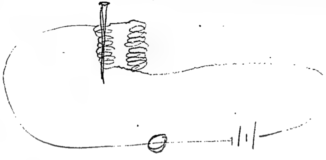
"Running 250 Gramme Machine Co with batt.—

Same page 13.

Current diagrams

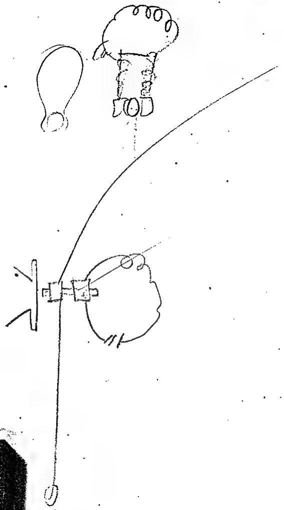






80'

About Decr 20/78 to Jan 1, 79
the date at head of specimen is
Dec 20, 78, [illegible]
date in book Jan 10. 79



Patent Office Gazette Vol. 7. P. 367

Edison's Patent No. 160,405,

Filed July 29. 1873

The Speaking Telephone Interfe-

-rence 2d. Application No. [illegible]

Resistance in use of [illegible]

Same Exhibit 32
" " " 39

Same 75 – 3d Sheet

Pat No 203,018 Apr 30. 1878

All same book.

S.A.E. U.S. Patents.

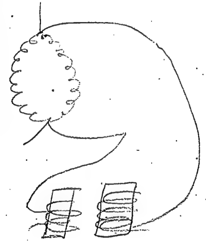
No. 147,311 Feb. 10, 1874.
" 150846 May 12, 1874.
" 160405 Mch 2 1875.

Bill Book (Menlo Park)

1 - 9 in Electrical Machine
$750 from Wallace & Son.
October 7th 1878.

Book No. 45 - Page 38.

May 13. 1879 J. W. E.



Book No 77. Page 1 etc. June 16, 1879

Results from Book 8 Page 91. Series
Edison 2 pieces probably 1120
8 ohms total 120 Volts
Circuit open 9.75
50 ohms 27.7 P. 94.
After bringing up field by short-circuiting 544 Volts

30 ohms	42.6 Volts
20.5 ohm	84.9
11.2 "	116
10.2 "	114
7.25 "	111

Gramme in field
15.35 ohms.
123 Volts

Book No 77 Page 3 —
(Same date)

New Machine Gramme on field

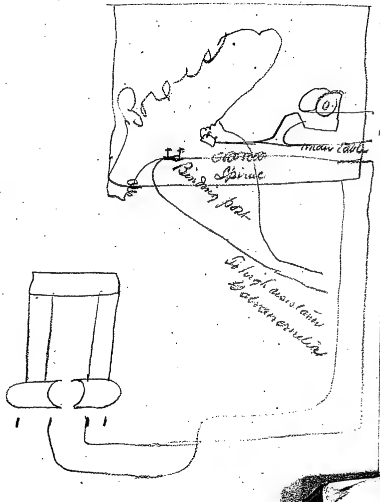
on field	E.M.F.	R.
11 webers	50.5 Volts	9.1 ohms
11	50.4	77
8.55	45.7	

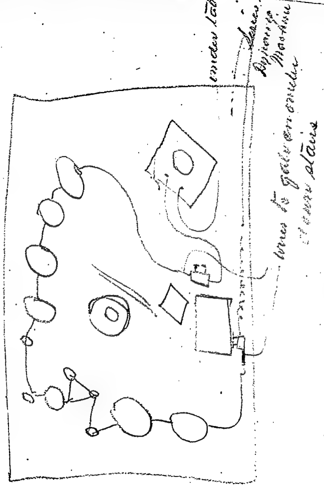
Running its own field

Ch 6.3 Ohms	59.3	2.18
6.35	635	
6.3	62	

References as above are a number of consecutive pages in Book No. 77 — from page 1 —

Book No 77. Page 115
Probably last of Novr 79




under table
Leaves to Dynamo Machine
wires to galvanometer down stairs

[ITEM FOUND IN BOOK]

Johnnie
Please send me the date the Wallace Machine was received at Menlo, by Saturday or write me, that I may go out to search for it myself, before the 11th
Yours
C. P. Mott

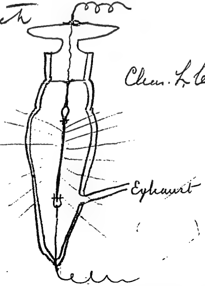
Desk Dynamo
Book 25 - page 13 = 14 = 15 -

No 28. p 82 -
No 13 p 8.

Ground glass
Vol 22 p 27 - 29

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.
New York, ...188

Mr. Edison, I devised the lamp with ground stop cock in Feb. 15 1880 and tried the first experiment with it on Feb. 26th, The construction was as per sketch



Chas. L. Clarke

[ITEM FOUND IN BOOK]

October 7th 1878

1 - 9 in Electric Machine

$7.50.

Wallace and Sons

Bill Books

C.L. Clarke

Ground Glass seal.

[ITEM FOUND IN BOOK]

Weston | Disc connections from bars.&c to comm=
Edison es | Statement - due July ~~16~~ 30 1881

Clarke July & Aug 1880, says Mr E. made a sketch antedating him two or three weeks

Mr. Batchelor says John Ott made a machine in 1879.

Book No. 7 pages 117. 119. 125. No 2. p 39. No 1 pg 49. No 20 p. 206. No 23. p 69 &c. No 20 p 19. 33 &c. - No 15. p 46. No. 41 & p 17 &c. No. 28 p 11 &c. No 14 - p 69. 117 &c. No 10 p 173 &c. 207 &c. 247. No 11 p 31, 103. 12 p 119 - Order book No 1 refers to Note book No 24 (not found) for a number of Machines early in 1879. -

No 13 p. 8 &c. 39. No 14 p 167. 182 205 - No 15 p 90. No 25 p 13 (0000) 15 &c. - No 26 p 156 - ~~[illegible]~~ No 29 p 125 -
No 46 p. 19

Menlo Park Notebook #148 [N-80-10-08]

This notebook covers the period October 1880. The entries are by Edison, Francis Upton, and Francis Jehl. The book contains notes and drawings by Edison regarding tests made of the first 69 lamps from Lot 2. Included also are statistical results by Upton and Jehl. Tests of lamps 70-98 can be found in Menlo Park Notebook #149. The label on the front cover is marked "Lamps Lot 2," "Oct 1880," and "Francis Jehl." The book contains 284 numbered pages.

Blank pages not filmed: 30-31.

Index.

Lamps
Oct 8 1880

Francis Jehl

This is lot No 2

~~This lot ... Karl~~

~~No 2~~

212
2)424
141 V

880130

31400
3200
2)34600 (173

121)648600 (5360

3544)330000 (9.3
31896
11040

No 1

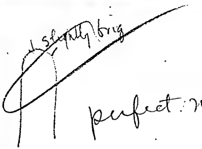
E.M.F.	212 - 212	141 V
		173 R
Res	$\frac{31400 + 3200}{200}$	5090 FT lbs
C	48	+ 15.0 mins ✓

Blue at the clamp

E.M.F.	182 - 181	121 V
		183 R
		3544 ft lbs
Res	$\frac{31400 + 5300}{200}$	9.3 H.P
C	not blue in clamps at 16	

183) 648600 (352
552
966
915
510

183) 648600 (3544
549
996
915
810
732
180



perfect no spot,

It was blue in the clamps.

Francis measured it after few minutes burning and it was only 36 Candles –

Now it is curious as he had tested it at 48 + made such a resistance that notwithstanding its blue it should have given 48, yet it only gives 36 apparently it has leaked since test, or — well what?

busted – arc – R Coil burned honeycombed ~~at~~ clamp on negative 8:15

at last – burned out – 8:30

its going again on another R coil fair

208
3)416
138 V

355

31400

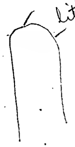
843650

178
177
3)355
151 V

3)355
1150

163) 585870 (3594
489
968
815
1537
1467
702

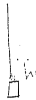
E. m7	208 – 208	138 V
R	$\frac{31400 + 500}{200}$	159 R
		5243 ft lbs
		+ 17 others
C	48	Hg in the globe
E. m7	178 – 177	1150
R	$\frac{31400 + 1500}{200}$	163 Rs
		3594 ft lbs
C	16	



appears to be a
Crack here

no blue at clamps

Res burned



(see Spring)

black deposit Carbon
on [illegible]

No crack in
tits -
~~appears to be a~~

I see few globules
of mercury inside
& at bottom.

224
223
$\overline{6)447}$
149V

31400
5100
$\overline{2)36500}$ 184 Res

14 . . . 0

31400
7100

192
193
$\overline{3)385}$
128

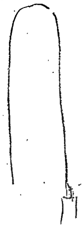
$\overline{2)38500}$
192 Res

E. M. F.	224 − 223	149 V 184 Res
R	$\frac{31400 + 5100}{200}$	5345 ftlbs
C	48	+ 5 Ohms ✓
E. M. F.	192 − 193	128 V 192 R
R	$\frac{7100 + 31400}{200}$	3776 ftlbs
C	16	

192)725810(3776
576
1490
1344
1461
1344
1170
1152

No. 3

~~perfect~~ no spots



blue at clamps Reo burned

arc sprung

No cracks in tube.

$$\begin{array}{r} 220 \\ 3\overline{)440} \\ 146 \end{array}$$ ✓

31400
15..0
270
164 R
123
90

185
183
368
122 ✓

31....
168 R

Emt	220 - 220	146 ✓
		164 R
R	$\frac{31900}{200} + 1500$	5767 ft lbs
C	48	
	Blue in globe	
Emt	185 - 183	122 ✓
		168 Res
R	$\frac{31400}{200} + 7200$	3924 ft lbs
C	16	

$$\begin{array}{r} 168\overline{)659360}\ (3924 \\ 504 \\ \hline 1553 \\ 1512 \\ \hline 416 \\ 336 \\ \hline 800 \\ 672 \end{array}$$

no spot

Went in the glass
arc spring.

It was blue in the clamps

but not on 1st reading

This lamp had no Res Coil

Glass all [illegible] pieces

20)950
204) 85-6
4.

202
204
2)406
135 V

15 3
112 4

25150
5100
20)30250(151 Res
20
102
100
25

172
172
3)344
114 V

25150
6400
)31550 (157
1

157)575120 (3660
471
1041
942
1052
1049
10

E m f	202 - 204
R	$\frac{25150 + \cancel{5100}}{200}$
C	48

135 V
151 Res
~~6109~~ ft lbs
5350
+20 Ohms!

little blue in the globe

E m f	172 - 172
R	$\frac{25150 + 6400}{200}$
C	16

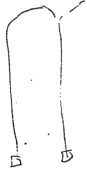
114 V
157 Res
3660 ft lbs

No spots

Blue at clamps

Res OK

busted here



big lot of
Moss Carbon

tits not cracked

215
215
31423
144 v

31400
1200
200) 32600 (163 Res
200
1260
1200
600

182
33124
121 v

31400
3500
34900
174 R

$\frac{12}{16}$ $\frac{6}{8}$ $\frac{3}{4}$

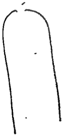
Em 6	215 - 215	144 v
R	$\frac{31400 + 1200}{200}$	163 R
C	48 + 10 Ohms ✓	5635 ft lbs
Em 7	182 - 182	121 v
Res	$\frac{31400 + 3500}{200}$	174 R 3727 ft lbs
C	16	

174) 648600 (3727
522
1266
1218
480
348
1320
1218
102

little brighter

not blue in lamp

hw



Square break

Reo ok
no arc

globe Clear -

200 | 8000
40

223
223
3 | 446
148 V

31400
1300
20 | 32700 (163 R
126
68

314
31
345
172 R

180
2
3360
1200 V

31400
3100
2 | 34500
172

7

E m 7 223 - 223 148 V
163 R
Res $\frac{31400 + 1300}{200}$ + 6 Ohms 5953 ft lbs
C 48
little blue in globe

E.m7 180 - 180 1200
R $\frac{31400 + 3100}{200}$ 172 R
3644 ft lbs
C 16

172 | 627920 (3644
516
1119
1032
872
688
840

top edge of
tit on Neg. side
little fused

little brefile

Arc sprung Res burned

Tit cracked
but only around
top

here
negative

blue on clamps

212
2
3|424
141 ✓

31400
1100
20)32500(162
20
125
120
50

179
2
3|358
119 ✓

31400
29
2|34300
171

171)627300(3668
513
1143
1026
1173
1026
171 1470
366 1368
102

Cwt	212 − 212	141 ✓
R	$\frac{31400 + 1100}{200}$	162 R
		5436 ft lbs
C	48 +14 ✓	
E.wt	179 − 179	119 ✓
R	$\frac{31400 + 2900}{200}$	171 R
		3668 ft lbs
C	16	

8 Nosples.

Blue at clamp x

Split in Clamp

Res formed - Arc

Sprung

Split Clamp on negative side and there -

top of tit on negative flat

fused no cracks in tits

215
3430
143V

31400
3200
28600 (173
44
60

180
3430
120 V

31400
4800
36200
181

181) 637720 (3524
543
944
905
392
362
300
724

emf	215 - 215	143V
R	$\frac{31400 + 3200}{200}$	173R
		5236 ptells
c	4.8	+ 12
emf	180 180	120V
		181 R
	$\frac{31400 + 4800}{200}$	3524 ptells
c	16	

9. no spots

Burned its Res - but Lamp
Ok - but I notice that there
has been internal arcing
in Carbon at clamp.

Martin puts in another Res
& arc sprung.

burned Res
again

Howell says no
blue but
Clamp little black
towards position

no cracks in
tits

185) 642331 (3472
555
873
740
1333
1295

226
225
451
150 V

31400 381
3500 386
174 R

148
90

185
186
371
123 V

31400
5100
37100
185

185) 670210 (3623
555
1152
1176
421
260

104.4

185) 642331. (3361
555
873
555
318

1087936
44.3

4349808
5799744
5799744
6423310648

E M F	226 – 225	150 V
Res.	31400 + 3500 / 200	174 R
C	48	~~527~~ 5728 ft
		+ 3 V

Blue at the clamp

E M F	185 – 186	123 V
Res	31400 + 5700 / 200	185 R
C	10 not blue at 16	3623 fills

$.18 = 32^{1.0079}$

3623
3472
151

185
186
64) 371. (5.7
320
510
448
62

58
18
464
58
1044

104
104
416
1041
10816
443
32448
43264
43264
185)4791488 (2589
370
1091
925
1664
65

3222
2224
1034

2589)33000 (13.
2589
11110
500

No 11

little low no spots

blue at clamp on first reading by Martin - not blue on Howells reading

arc sprung = had scarcely any wire on Reo coil = platinic leading wire burned off at tit.
+ Carbon broken at top probably mechanically = I notice a crack in one of the tits perhaps air passed in + that made the arc

~~fil~~ neg til fused at top.

Crack in Positive tit

227
225
150 V

31400
178 R

191
1270
185 R

31400

11

Cut	227 − 225	150 V 178 R 5599 ft lbs
Res	$\frac{31400 + 24300}{200}$	
@	48	+ 4 ✓
Cut	191 − 190	
Res	$\frac{31400 + 45600}{200}$	
@	16	

11 - no spots ~~neg~~

(Marked at factory) split in clamp - I find split was at negative pole -

arc sprung - Res Coil burned but 2 turns on it - platina wires fused off at negative tit

Howell says no blue but clamp to Positive black. - negative tit cracks but probably by melting of platina - Think Carbon was intact & broken mechanically

3)420
140 V

25150
5100
3)30250 4151 R

174
3)348
116 V
159 R

25150
6700
20)31850 (

Emt	210 - 210	140 V 151 R
R	$\frac{25150 + 5100}{200}$	5750 ft lbs
C	48 . + 14 √	
Emt	174 - 174	
	$\frac{25150 + 6700}{200}$	
C	16	

12 no spots

Blue at clamp x

Bushel arcd - Res burned

plat wire wire fused 1/4 inch from glass tit positive side & top of tit fused at negative

Carbon intact only separated from wide part of thick end

arcd & split on clamp

Honeycombed

Negative Dark

Lettt

218
214
182
144 V

31400
200
2)31400
158 R

180
3)360
120 V
168 R

31400
23000
2)337
168

Elect	218 − 214	144 V
R	$\frac{31400+200}{200}$	158 R
		5813 ptls
C	48	+ 10 √
E	180 − 180	120 √
Res	$\frac{31400+23000}{200}$	
C	16	

13 no spat; Lot 2

Blue at clamp x

went at 4.05 P.M. Oct 16.

$$\frac{222}{226}$$
$$2\overline{)448}$$
$$149\sqrt{}$$

$$\frac{31400}{2500}$$
$$2\overline{)33900}$$
$$169R$$

$$\frac{207}{203}$$
$$2\overline{)410}$$
$$136\sqrt{}$$
$$177R$$

$$\frac{31400}{4100}$$
$$2\overline{)35500}$$
$$177$$

Elect	222 – 226	149 V
R	$\frac{31400 + 2500}{200}$	169 R 5819 ohms
C	~~16~~ 48 + 5√.	
	Blue at the clamp.	
Elect	207 – 203	136
R	$\frac{4100 + 31400}{200}$	177 ohms
C	16. Blue at 16	

14 no spots low red
just visible
blue in clamp - busted
are sprung Red burned
platina wires burned at tit

I notice there is a resistance
Coil in here of 2 turns yet
this lamp was awful
low as compared to the others
platina fused down in positive tit
Negative tit fused at top-
Beautiful shining carried Carbon on plate
of Carbon at Positive Side

little filament
as if arced internally
where it broke

$$\begin{array}{r} 210 \\ 212 \\ \hline 3)422 \\ \hline 140\,V \end{array} \qquad 2)\underline{31400} \quad 157\ R$$

$$\begin{array}{r} 170 \\ 2 \\ \hline 3)340 \\ \hline 112\,V \\ 168\,R \end{array} \qquad \begin{array}{r} 31400 \\ 22000 \\ \hline 2)\,33600 \\ \hline 168 \end{array}$$

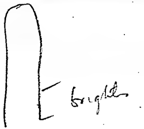
Emf	210 212	140 V
R	$\frac{31400}{200}$	157 R
		5530 ft
C	4.8	+15 ✓

Blue at the Clamp

Emf	170 – 170	113 ✓
Res	$\frac{31400 + 22000}{200}$	168 ohms
C	16	

Little Blue at the clamp

15' -



Blue at clamps

Arc sprung
Res busted or
rather burned —
Carbon appears
Intact —

198
196
3)394
131 V 20)28650 143 R
25150
3500
207
86
60
.65

163
164
3)327
109 V
152 R

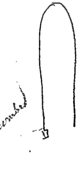
2.5150
5200
20)20450

Emf	198 - 196	131 V
R	$\frac{25150 + 3500}{2000}$	143 R
		5316 fillbs
		+ 24 √
C	.48	
	Hg in The globe	
Emf	163 - 164	
R	$\frac{25150 + 5300}{200}$ = 152 Ohms	
C	16	

nospots.

Blue at Clamps

Resturned =



Carbon not fusted
but honeycombing
gave vapor carbon
& formed arc

Mercury in globe

230
226
2)456
152

31400
5400
36800
184 R

195
3)390
130
194 R

31400
7500

17

E.M7 230 − 226 — 152
184 R
5560 [illegible]

R $\frac{31400 + 5400}{200} + 1$

C. 4.8
Blue in Clamp

EM7 195 − 195 — 130

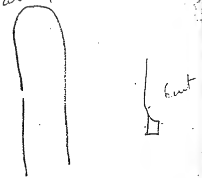
$\frac{31400 + 7500}{200}$

C 16
Not blue at 16

17 - no spots

blue at clamp No wire
Carrying shining towards
Positive and little over on

no crack in tube



other side towards negative
blacks spots 1/4 inch long
Many shiny spots.

Little Hg in globe

215
218
3|433
1445

31400
2500
2|33900
169 R

185
185
3|370
1235
179R

31400
4500
2|35900
179

Emf 215-218 1445
169 R

R $\frac{31400 + 2500}{200}$ 5438 fills

+29 √

C 48

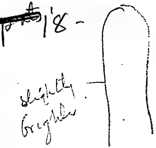
little blue at the clamp

Emf 185 - 185 1235

Res $\frac{31400 + 4500}{200}$ = 179 ohms

C 16 not blue with 16

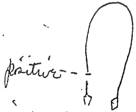
~~[illegible]~~ 18 -



Blue at clamps slightly

Lot 2

broke 2,30 P.M. Oct-16



no resistance.

215
212
431
143 ✓

31400
2000
33400
167 R

186

31400
3500
~~...~~

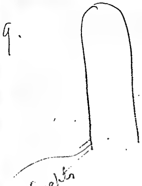
20
180

14900
174

Ench 215 – 216. 143 ✓
R $\frac{31400 + 2000}{200}$ 167 Res
5424 files
C 48 +12 ✓
Blue at clamps

Ench 186 — 186 124 ✓
R $\frac{31400 + 3500}{200}$ = 174 ohm
C 16
not blue at 1.6

19.



Graphite

little bent

No crack in tile

Blue at clamps

Lamp removed to Regulator

Res Coil burned arc Spring

209
210
3 | 419
139 V

31400
200
2 | 31600
158 Res

175
177
3 | 352
117

Elect 209-210 | 139 V
158 R
5410 Res

R $\frac{31400 + 200}{200}$

C 48 +16 ✓

Little blue at one clamp

Elect 175-177 | 117 Volts

R $\frac{31400 + 1700}{200} = 165$ Ohms

C 16

20
no Spots!

Blue at clamps

Res burned arc spray

badly honeycombed
negative

240
242
31400
160 ✓

31400
2700
34100
170 R

215
143

21

MF 240 − 242 160 ✓

R $\frac{31400 + 2700}{200}$ 170 R
6671 ft lbs

C 48 Too high

Blue at Clamp and
Hg in globe

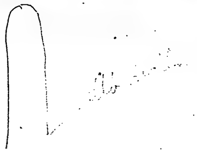
MF 215 − 216 143 ✓

R $\frac{31400 + 4500}{200}$ = 179 ohms

C 16

Blue at Clamp
at 16

21



No Res Carlin at

one spring glass

all bused up =

Blue at clamp x

204
202
3400
136

25150
2500
27650
76
765

1725
1724

22

Ewt 204 - 205 1360

R. $\frac{25150 + 2500}{200}$ 138 R

5937 lt

C 48 +57

Blue at the clamp
& Hg in globe

Ewt 172 - 175 115.6

R $\frac{25150 + 4500}{2000}$ = 148 Ohm

C 16

Blue at the clamp
and Hg in the
globe

72

Little dull no spot

Not blue at clamp

After burning some 4 hours,
looked badly spotted,
also blue at positive clamp.

---

broke at 11.40 A.m Oct-14.

Mr Edison changed the poles a few minutes before it broke, carbon then almost entirely gone.

212
2
424
141 √

25150
3900
3160

110

182
182
3 | 366
122

23

Cut 212 - 212

141 √
155 Res
5682 pcbs
5682

R $\frac{25150 + 5900}{200}$

C 48 + 13

Blue at The Clamp

R Cut 182 - 182 12-18

R $\frac{25150 + 7600}{200}$ = 163 Ohms

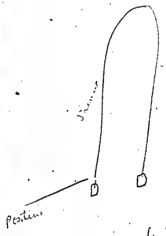
C 16

Blue at the C

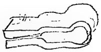
4.2984382
1.6464037
7.8096683
13.7545102 = 5682.

23 - no spots

Blue at the clamps



Res ok -
no arc -



Crack in nickel
fluffy carbon
Sticking to crack

$$\frac{232}{230}$$

$3|\underline{462}$
154 V

$$\frac{31400}{500}$$

$20\,|\,\underline{3\cancel{1}9\,00}$
159 R

314
27
2 | 342
171

195
195
390
130

24 Oct 9

E 1117 ~~213 – 215~~ 232 – 230 154 V

Res $\dfrac{31400 + 500}{200}$ 159 R

6616

C 148

Blue at the clamp

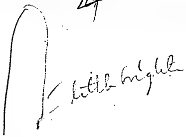
E 1117 195 – 195 130 V

R $\dfrac{31400 + 2900}{200}$.

C 16

Blue at 16 candles

2/4



This spot is growing fearfully
bright at spots = just busted
& busted at bright spot,
it was blue on clamps badly
Carrying in carbon — showing
deposit on Carbon toward
the positive — This lamp
has no Resistance Coil.

Blue at Clamps

I notice these Cracks in metal of nickel
Clamps both poles coated at cracks with
Carbon

25

Could not get This
one up to 48 C
It was blue at the
Clamps. Res high

25 – low no spot.

Blue at Clamps

No Porcelain

Arc Spring

Glass all bracketed

215
3)430
143 √

25150
4600
20)2975 (148
97
175

2515

176
25150
6600

26

E 217 | 215 − 215 | 143 √
| | 148 R
R | $\frac{25150 + 4600}{200}$ | + 10 √
| | 6120
C | 48

Blue at clamp. but little

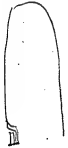
East | 176 − 178 | 118
R | $\frac{25150 + 6600}{200}$
C | 16

not Blue at 16

26 - no spots - quite bright

Res Coil - burned -
arc spurring -

Shop card says split at clamp



Lampblacking towards negative

Blue at clamps.

Top negative tit fused -
platwire melted off on positive
Considerable black deposit on
Negative as well as Positive
~~Carbon~~ Clamp split at Positive

$$\begin{array}{r} 229 \\ 230 \\ \hline 2)459 \\ 153 \end{array}$$ ✓

$$\begin{array}{r} 31400 \\ 5000 \\ \hline 2)36400 \\ 182 \end{array}$$

27

em7	229 – 230	153 ✓ 182 R
R	$\frac{31400 + \cancel{5000}\ 5000}{200}$	
C	48	5690 ft. lbs
	Blue at 1·· Clamp and Hg in The glob	
em7	200 – 201	137
R	$\frac{6600 + 31400}{200}$	
C	16	
	Blue at 16	

27 – no spots – low

Bulb in glass all to pieces. – no Res

Coal with this lamp

Blue at clamp

$$\begin{array}{r} 218 \\ 3\overline{)436} \\ 145\ \checkmark \end{array}$$

$$\begin{array}{r} 31400 \\ 2300 \\ \hline 2\overline{)33700} \\ 168\ Re \end{array}$$

31400
3800
200 | 352
176

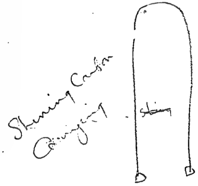
185
187
3 | 372
1

28

E.M.7	218–218	145 ✓
R	$\frac{31400 + 2300}{200}$	168 R
		+ 9 ✓
		5540.
C	48	
	Blue at 48 at the Clamp	
E.M.7	185–187	126
R	$\frac{31400 + 3800}{200}$	
C	16 Blue at 16 at the Clamp	

28
nospots

Blue at clamps
Res OK - no arc



No crack in tits = Mercury in globe
<u>Cracked</u> <u>badly</u> where
<u>sealed</u> -

205
200
3 | 410
136√

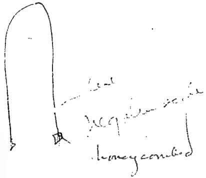
31400
2500
2 | 33900
169

29

EMT	205 - 205	136√
		169 Req
R	$\frac{31400 + 2500}{200}$	+ 21√
C	48	4850
EMT	177 - 178	118 3
R	$\frac{31400 + 3800}{200}$	
C	16	

29 – no spots

Blue at clamps



Res OK – glass clean

212
212
3 | 424
141 V

2 | 314
157

31...
1...
...
16...

18...
18...
3 | ...
12...

30

Emf	212 – 212	141 V
		157 Res
R	$\frac{31400}{200}$	+13 ✓
		5610
C	48	
	Blue at the clamp	
Emf	184 – 185	123 V
R	$\frac{31400 + 1300}{200}$	
C	16	
	Little Blue at 16 at the Clamp	

30 Slightly (very) Spotty
different places

Blue at clamps

depositing Carbon on
positive side & few places
no negative side. alternating
with very black spots.

Mercury in globe - not cracked
in tits ? rather that splitting
nickel metal is coated
with Carbon on Positive at Cracks
I guess its the points that
attract.

30 Slightly - (very) Spotty
different places

Blue at clamps

depositing Carbon on
positive side & few places
on negative side. alternating
with very black spots.

Mercury in globe - not cracked
in tits radial thal splitty
nickel metal is coated
with Carbon on Positive at cracks
I guess its the points that
altered.

$$3\overline{)460}\atop 153\ V \qquad 2\overline{)37100}\atop 185\ R$$

230 3 | 31400 2

3 | 140

31

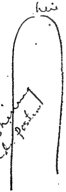
emf	230 − 230	153 V 185 R
R	$\frac{31400 + 5700}{200}$	5600
C	48 C Blue at the clamp.	
emf	205 − 205	136
R	$\frac{31400 + 7400}{200}$	
C	16 Blue at the clamp	

31 —

bright

I notice that there are air bubbles 1/16 down into each lit on platina did heat bring the air out platinum

busted — (Shop slip says Split in clamp)



no Res Coil —

Blue in clamp

no crack in tits

neg nickel clamp no change looks as if just put in

212 25150
5900
141 31050

32

Cut ~~220~~ ~~222~~ 212 – 212

R $\frac{25150 \quad 5900}{200}$ + 13 141 155 Res

C 48 5680
Blue at The Clamp

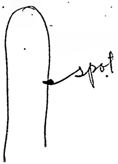
Cut 179 – 180 120

R $\frac{25150 + 7500}{200}$

C 16

32

Little Hg in globe



Res Carb burned - arc

sprung

- towards negative

undoubtedly split in
clamps & arced there

Carbon OK.
top lat on negative fused
Blue at clamp
plat wire fused $1/4$ inch up on Positive

$$\begin{array}{r} 213 \\ 2 \\ \hline 3\,)\,426 \\ \hline 142\checkmark \end{array} \qquad \begin{array}{r} 314 \\ 12 \\ \hline 2\,)\,326 \\ \hline 163\checkmark \end{array}$$

Emf 213—213 — 142V, 163 Res

R $\dfrac{31400 + 1200}{200}$

C 48 — 55.30 +13√

Emf 176—176 — 117V

R $\dfrac{31400+3000}{200}$

C 16

124 3/11

99
99
891
891
9801
39204
39204
124 3) 43 372 3?9 49 34

33 nospots.

Blue at clamps slightly
- Res burned - are
Sprung -
Little H g in globe

negative
Honeycombed ??

224
225
3 | 449
149 V

314
45
2 | 359
179 R

194
194
368

34

Elw 7 224 – 225 1490
179 Res

Res $\frac{31400 + 4500}{200}$ + 5 ✓
5500

C 148
Blue at the ǝ[illegible]

Elw 7 194 194

R $\frac{\cancel{344}00 + 6800}{2000}$

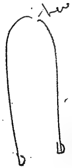
C 16
not Blue

34
slightly spotty

Blue at Clamps

not as good at neg + clamp End
Clean as as of
just put in

fits no crax



slightly fuzzy on pos[illegible] side
Shiny here.
positive -

Res OK no arch

by letting Carbon arc
Keep up when top 1/2
inch away

217
217
2|434
144V

314
29
2|342
171R

178
178V

314
48
362
181 Res

181 | 343 30 (3408
8
1448 | 736
724
1430

Second lot.

Ent	217 – 217	144V
	31400 + 2900	171R
R	200	+11
C	48	5370

Blue in globe

Ent	178 – 178	118V
R	31400 4900	181 Res
	200	3407 fl Ch
C	16	

2.0718820
4.1477660
7.6440277
7.7423214
3.5324090891
30407

34

no spots - bright

--- hev

Shopclip
Says a. it is
broken at clamp
but way out so
dont make much
difference

Res OK

no arc -

Globe blackened
very much

Blue at clamp

no crack in til

Notice in blackened globe that
there is a white streak no deposit
on this as parallel to Carbon
Cant say which pole = both
clamps perfectly clean

3|460
153 V

314
43
2|357
178 R

3|380
126 V

31400
6600
380
190 R

19) 70331 (3701

2.1846914
2
2.3693828
1.6464037
7.7495791
3.7653656

5825.9

Am7 230 − 230

153 V
178 Res.

R $\frac{31400 + 4300}{200}$

C 48

5820

Am7 190 − 190

126 V
190 R
3701 [illegible]

R $\frac{31400 + 6600}{200}$

C 16

C

1846914
2
2.3693828
1.6464037
7.7495791
01.7653656

36. No Spots

Blue at clamps

arc sprung — No Res

Clamps not black. Carbon intact. both platina wires burned off at lits — globe clear

$3|\underline{420}$
140 V √

314
24
$2|\underline{338}$
169 Res

~~178~~ 175
2
$3|\underline{350}$
116 V

31400
4200
$2|\underline{357}$
178 R

$178)\,591600\,(3324$
534
621
578
430
356
740
712

Emf	210 – 210	140 V 169 Res
R	$\frac{31400 + 2400}{200}$	+ 16 √
C	48	5120
	Blue in globe	
Emf	175 – 175	116 V 178 R 3324 ft lbs
R	$\frac{31400 + 4300}{200}$	
C	16	

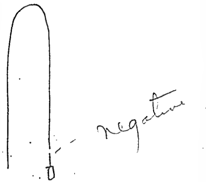
1

117.
117
819
117
117
13.689
44
54756
54756
602316
4500
177) 606.816 (3428) 33000 (9
531
758
708
501
354
147

177

31 No Spots

~~not blue at clamps~~



Glass little dirty
Res OK No
arc —

247
3 | 494
164 V

3765
3650

37650
8500
200 | 46650 230

3 | 420
140

37650
11200
200 | 48850

244
1472
355

2080

38

Elm 7 | 247 · 247 | 164 V 230 Re

R | $\frac{37650 + 8500}{200}$

C | 48
Blue in globe

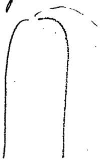
Gm 7 | 210 − 210 | 140 V 244 R 355 8

R | $\frac{37650 + 11200}{200}$

C | 16

38 Bright over top

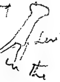
It went where bright spot was



bushed

. No Res Coil = did not arc
split in clamp blue on
Clamps -

White looking opalescen
at top of sealing



Lev

think there is a Crack in the
lit -

E

$$\begin{array}{r} 212 \\ 210 \\ 3\overline{)422} \\ 1 \end{array}$$

$$\begin{array}{r} 314 \\ 20 \\ 2\overline{)332} \\ 167 \end{array}$$

$$\begin{array}{r} 175 \\ 177 \\ 3\overline{)352} \\ 117 \end{array}$$

39

Amp	212 – 210	~~???~~ Volts 140.6
R	$\frac{31400+}{2000}$	157 Ohms
		+13 ✓
C	48	5610

Blue in the globe

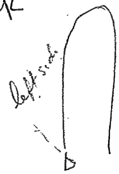
Amp	175 – 177
R	$\frac{31400 + 2000}{2000}$
C	16

39

Bright on whole left side

Not blue on clamps

Res OK



No arc

a legitimate bust up

171
16·8
3 | 33 9
113
1 1

314
·2·2
2 | 33 6
168
1

Em7 200-205 135 Volts

R $\frac{31400}{200}$ 157 ohms

+21 V

C 48

5140

Em7 171-168

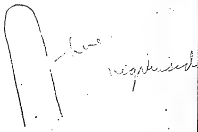
R $\frac{31400+2200}{200}$

C 16

No Spots

Not blue on clamp

Resistance burned
arc spring
platina melted aft. out
~~It got~~ positive lit



probably spot occurred &
throughout vapor & arc
Spring.

25150
4550
$\overline{30650}$
$\underline{200}$
1060
1000
$\overline{65}$

173
173
$\overline{346}$
115

Em7	207 — 207	138 Ohm
R	$\frac{25150 + 4000}{200}$	146 Ohms
C	48	+ 16 / 5780
	little Blue	
Em7	173 — 173	
R	$\frac{25150 + 5500}{200}$	
C	46	

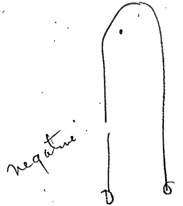
41

No Spots

Not blue arc lamps

No arc Residue

Coal Ok



25150
5700
200 | 30850
20
1085
1000
85
80
5

168
168
9 | 336
112

42

EM7 197 − 197 131.3 Volts

R $\frac{25150 + 5100}{200}$ 151.2 Ohms
+ 25

C 48 5020

EM7 168 − 168

R $\frac{25150 + 5700}{200}$

C 16

42

No Spots

Blue on Clamps slightly

Large blue on clamp

Res burned are Spring honey(comb)

Negative clamp

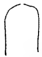
badly - Carbon not

wholly broken He

Connects it again + at 0.000

OK - + then again it

again is busted at top



31400
3200
34600
200 | 34600
173

179
179
2 | 358
179

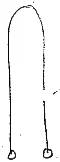
43

EMF	205 – 205	137 Volts
R	$\frac{31400 + 1500}{200}$	164 ohms + 19
C	4	5060
	little, Blue in glob	
EMF	179 – 179	
R	$\frac{31400 + 3200}{200}$	
C	16	

43

Mr Spots

Not blue on lamps



positive side

Globular light

blackened

No arc Rev Of

This lamp had been

put in wrong side, hence

Break now in P was

burned longest on neg

31400
5200
$\overline{36600}$
200) 366
183

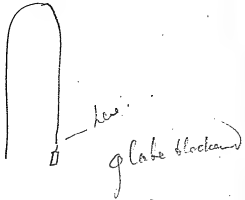
180
180
$\overline{360}$
3) 360
120

44

Emf	217 – 217	145 Volts 178 ohms
R	$\frac{31400 + 3400}{200}$	+ 9√ 5350
C	48 Blue in the glob.	
Emf	180 – 180	
R	$\frac{5200 + 31400}{200}$	
C	16	

44

No Spots



Res OK – no arc

Not blue on clamp

Slightly honeycombed in clamp

Clamps perfectly clean

no cra

25150
7300
32450
2 | 32450
| 1762

166
167
2 | 333
111

45

Hg in the robe

Ew4	198 – 198	132 Volts 1530 ohms
R	$\frac{25150 + 5500}{200}$	+ 24 √
C	48	5048
	Blue in the robe	
Ew7	166 – 167	
R	$\frac{25150 + 7300}{200}$	
C	16	

41

No Spots

not blue at clamps

Res burned - are Spring

fearful lot of mercury w. globe dirtied top 7/46

here cracked & also honeycombed

It was broken in large part Carbon undoubtedly by too light clamping & otherwise.

No blue on clamps

173
173
356

3 | 356 | 118.9

31400
1800
200 | 332 | 166

46

Out	~~203~~ - 204	136 Volts
R	$\frac{31400 + \cancel{3}}{200}$	157 ohms
		+ 20 √
C	48	5230
Out	173 - 173	
R	$\frac{31400 + 1800}{200}$	
C	16	

46

Low Slightly brighter
on Right hand side
near top

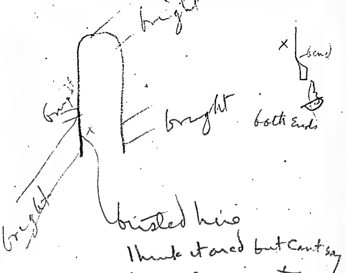
Blue on clamp

$$\begin{array}{r} 31400 \\ 9800 \\ \hline 200 \,)\, 41200 \\ 206 \end{array}$$

$$\begin{array}{r} 185 \\ 187 \\ \hline 2 \,)\, 372 \\ 124 \end{array}$$

Em7	Em7-223-225 148 volts
R	$\frac{31400 + 7000}{200}$ 192 ohms +6.
C	48 5050 Blue in the globe
Em7	185-187
R	$\frac{31400 + 7800}{200}$
C	16

47



The Res Coil of 47 got very hot and silk burned but lamp OK -

Not blue on lamp

Shop slip says Split in clamp & fitting found it very slight —

31400
4900
300 | 36300
121

180
175
355
3 | 355
118

217 — 220 146 Volts

$\frac{31400 + 2900}{200}$ 171 Ohms

+ 8

48 55 30

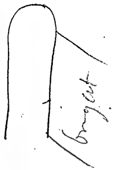
Blue in the globe

180 — ~~157~~ 0175

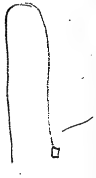
$\frac{31400 + 4900}{200}$

16

4 8



Brightest near bottom



busted in Carbon at

not blue but g

notice clamp block

No cracks in tito.

Opalescence at ∧ top

This lamps ~~res~~ resis
tance is very high.

49

Dull

little bright
near centre of
left hand side

Twas thi lamp, Arcd – had
frosted glass – Knocked hole
in it = There is no Res
Coal with this lamp

3140
750

$2 \overline{)\ 3911}$

177
178
355

$2 \overline{)\ 355}$
178

50

EM4 208–204 137 Volts

R 31400 + 5700 185 Ohms

2000 +22

C 48 4450

Blue ~~ed~~ in the globe

EM4 177–178

R 31400 + 7500

2000

C 16

50

Little brighter on left
hand side

N.A. blue on clamp

5 = Honeycombed. When split carbon
at clamp. negative side.

Res burned : arc sprung

Carbon Mechanically broken
Melted platinum wire off
at positive lit
didn't fuse top of lit on
negative filament —

Mercury in globe

2515
73
200
172
170
342

51

Cuct 205 - 205 137 Volts

154.2

$\frac{25150 + 5700}{200}$ +18 V

C 48

5400

Cuct 172 - 170

R $\frac{25150 + 7300}{200}$

@ 16

51

No Spots

split clamp

Not blue ar clamp

31400
9100
200 | 40500
202

192
192
384
1728
1
36864

emf 228 – 228 152 Volts

R $\frac{31400 + 7600}{200}$ 197 Ohms +1 ✓ 5190

C 48 Blue in globe

emf 192 – 192

R $\frac{31400 + 9100}{200}$

C 16

52

No Spots

Carbon Intact - glass OK but an arc sprung and burned platina leading wire off at tit = This lamp had no resistance coil. but about 2 inches wire -

No blue in 52 in clamps

25150
7200
200 | 32350 | 161.75

1700
3400

√3

last one of this flock

[illegible]	200 − 198	133 Volts
R	$\frac{25150 + 5500}{200}$	158 Ohms
		+ 24 √
C	48	4960
[illegible]	170 − 170	
R	$\frac{25150 + 7200}{200}$	
C	16	

53

No Spots

Not blue on damp

glass clear - Res Ok

$$\begin{array}{r} 31400 \\ 6000 \\ \hline 200\,)\,37400 \\ 187 \end{array}$$

$$\begin{array}{r} 185 \\ 185 \\ \hline 2\,)\,370 \\ 123 \end{array}$$

54

Received this Lot Oct 11 1880

Ellif 220 220 | 147 Volts

178 Ohms

R $\dfrac{31400 + 42000}{200}$ | +7 ✓

@ 48 | 5380

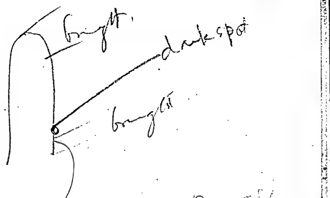
Blue with [illegible]

Ellif 185 – 185

R $\dfrac{31400 + 6000}{200}$

@ 16

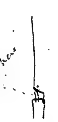
54



Busted here, Res OK

No arc - Globe better
blackened

Not blue on
Clamp



31400
3100
34500

$285 \mid 345$

172^2

29584

$3 \mid 115$

55

EM7	210 – ~~2~~10	140 Volts
R	$\frac{31400 + 1300}{200}$	163 Ohms +15 √ 5320
C	48 little Blue in globe	
Ohm7	172 – 172	
R	$\frac{31400 + 3100}{200}$	
C	16	

54 - no spots

Not blue on clamp

Res OK

here positive Sch

Busted

No arc

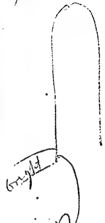
178
181
359
179

31400
5400
$200\overline{)36800}$
184

#56

Em7	220 - 220	147 Volts
		179 Ohms
R	$\frac{31400 + 3800}{200}$	+9
		5346
P	48	
	little Blue in globe	
Em7	178 - 181	
R	$\frac{31400 + ~~5~~400}{20}$	
C	16	

56



lite not
Crooked

Busted here — Res Coil

Burned Arc spring

Very blue clamps

little bent here
thick end on negative
Honeycombed

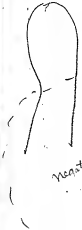
180
183
$2 \mid 363$
1.21

31400
6000
$200 \mid 37400$
187

57

EW7	212 – 212	141 Volts
		179 Ohms
R	$\frac{4400 + 31400}{200}$	
C	48	+ 15 √
		4920
EW7	180 – 183	
R	$\frac{31400 + 6000}{200}$	
C	1.6	

57



little bright

Not blue at clamps

negative side

Pos clamp little black.

But at bends where

there was bright spot.

Res OK – glass much

blackened – Shop slip.

Rays bristled at clamp

180
179
| 359
119 . 12.0

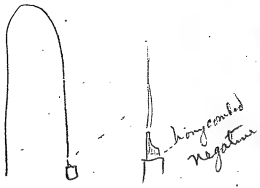
31400
4000
9.00 | 35400
177

58

EMF	215 − 214	143 Volts
R	$\frac{2600 + 31400}{2000}$	170 Ohms +12 5330
C	4.8 little. Blue in globe	
EMF	180 − 179	
R	$\frac{31400 + 4000}{200}$	
C	16	

58 -

both unequal



Res did not burn

No blue in clamps

No crack in lit

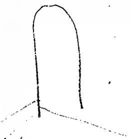
1755
175
$\frac{3250}{1746}$ 17

3174
45
$\frac{3599}{1799}$

59

Emf	210 – 210	140 Volts
R	$\frac{31400 + 2500}{200}$	169 Ohms
		+16
C	48	5120
	little Glue in globe	
Emf	175 – 175	
R	$\frac{31400 + 4500}{200}$	
C	16	

59



little bright

arc Spring Res

burned - Carbon broken

at clamp on <u>negative side</u>

No blue at clamp

314 00
430 00

200 | 178

185
185

123

60

EMF	215 – 215 145 Volts
R	$\frac{31400 + 3000}{200}$ 172 Ohms
C	48 +9 ✓ 5420
EMF	185 – 185
R	$\frac{31400 + 4300}{200}$
C	16

60 OK no spots

No blue in clamp

arc must have sprung
Resistance burned glass + plat
wires OK = The Vapor of
Carbon due to sudden bursting
of the spot did the biz

no crax in tits

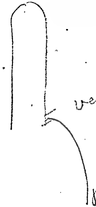
31400
5000
[illegible]
200
[illegible]

190
190
2 | 380
126 121

EM7	220 − 218	146 Volts 176 Ohms
R	$\frac{31400 + 3570}{200}$	+ 8 ✓
C	48	5360
EM7	190 − 190	
R	$\frac{31400\ 5000}{200}$	
C	16	

61

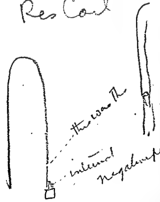
Lit on negative fused at top



very slightly brighter

Busted here.

Arc sprung Res Coil
burned



No blue on Clamps

this was the
internal
negative pole

6 thus arc still holds
~~plat fuse~~

170
170
31 9 40
713

170
3140
2 | 331
165

Elect	200 – 200	133 Volts
R	$\frac{31400}{200}$	157 ohms
C	48	+ 24
		4990
Elect	170 – 170	
R	$\frac{1700 + 31400}{200}$	
C	16	

62 [illegible]

No blue at clamp

~~no nothing~~

Res burned clamp melted to positive. arc sprung was a split in the clamp as if thick carbon was OK except inside clamp at negative End

63

31400
7500
84.00
194

198
132

Oct 7	230 – 228.	153 Volts 184 Ohms
R	$\frac{31400 + 5500}{200}$	
C	48	56.03
	198 – 198.	
R	$\underline{7500 + 31400}$	
C	16	

'63 - lotth unequal

Blueat clamps

No Resistance

The resistance of
this is [illegible]

64 — Low. [illegible]

spats

slightly blue and damp

No Res [illegible]

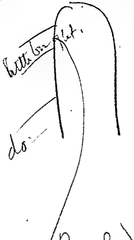
Glass [illegible]

192
192
3 | 384
128

65

Cut	225 – 225	150 Volts 180 Ohms
R	$\frac{31400 + 4700}{200}$	+ 3
		5540
C	48	little Blue in Lobe
Cut	192 – 192	
R	$\frac{31400 + 6200}{200}$	
C	16	

65



Slightly blue at Clamp

Broke here = Res Coil burned - not blue at 1st but on last count slightly blue =

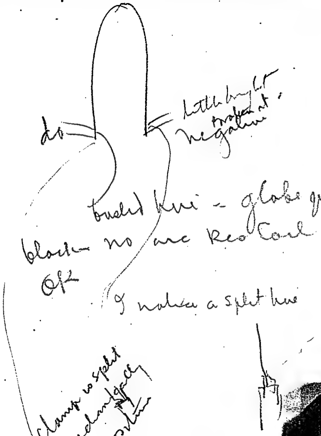
31400
4500
3|35900
179

175
180
3|355
118

Emf	217 217	145 Volts 170 Ohms
R	$\frac{31400+2600}{200}$	
C	48	+91 5460

Emf	175 — 180
R	$\frac{31400+4500}{200}$
C	16

67. no crat lits



bushed burn - globes gut

black no arc Reo Coal

OK

I notice a split here

clamp no split mechanically positive

Blue on clamp

205
205
410
136.7

25150
2200
27350
136.7

25150
3800
28950
144.7

160
162
322
161

25150
3800
28950 | 144.7 145

67

Amp 190-190 127 Volts
137 Ohms

R $\frac{25150 + 2200}{200}$ + 28

@ 48

5220

Amp 160-162

R 25150 + 3800

@ 16

This is the A[x] lamp
& a #

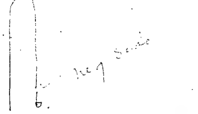
67

No spots

No blue arc clamp

no crack

Reo burned posit clamp melted. Carbon broke



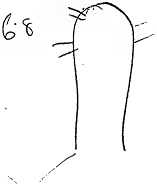
Carbon flux on neg clamp.
& angled towards negative side

31400
5900
200 | 37300
186

182
182
2 | 364
121

Cut	222–225	149 Volts
	31400 + 3700	175 Ohms
R	200	
		+5 ✓
C	48	5620
Cut	182–182	
R	31400 + 5900 / 200	
C	16	

6.8



slightly bright

busted here. Res Coil ~~Burned~~

arc sprung -

Carbon busted at edge

clamp -negative side

incandesced

Blue at clamp

25150
4300
29450

Emf 195 - 195 130 Volts
140 Ohms

R $\frac{25150 \cancel{+2500}}{2000}$

+ 25 ✓

C 48

5350

Emf 160 - 160.

R $\frac{25150 + 4300}{2000}$

C 16

.20 90 Lot-2

69 no spot

No blue at clamps

marked split at clamps on label

11.52 a.m
Oct 16-80


---negative

Res O.K.

1V
1V
1.
44

$1 \overline{)44}$
44

2
2
4
44
$2 \overline{)176}$
88

2 3
3
9
44
$3 \overline{)396}$
132

88
2
176

4 4
44
16
44
64
64
$4 \overline{)704}$
176

9
.8
.81
44
324
324
35.64
2
71.2

88
44
132

35.6
3
106.8

35.6
4
142.4

1 ohm = '4'

1 ohm 2 ohm 3 ohm 4 ohm
44 88 132 176

.9
35.6 71.2 . 106.8 . 142.4

156 ohm 1255 = 4400

1000 1000 = 4400

.9

20
.9
18.0

10) 156 (15.6 5
10
56 13.0.4 5

1 130
130
3900
130
16900
50 441
67600
67600 4.3
44 156) 743600 (4766
624
1196
1092
10400
9336
10640
19936

156
4
624 2

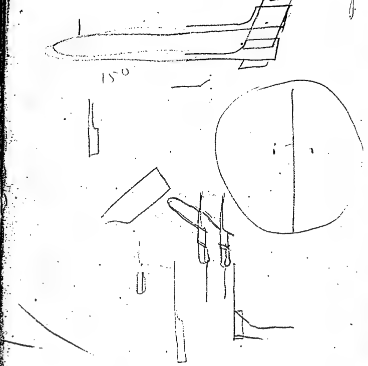
10) 125 (12.5
25

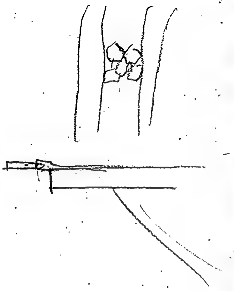
90
90
8100
44
32400
3240
356400

18.

112
112
224
112
12544
44
50176
50176
156) 516346 (3537
468
838
780
583
468
1156 4
1092
64

1 Volt = 100000000 units of Pot





PUBLICATION AND MICROFILM COPYING RESTRICTIONS

A Note on the Sources

The pages which have been filmed are the best copies available. Every technical effort possible has been made to ensure legibility.

38

END

FINANCIAL CONTRIBUTORS

PRIVATE FOUNDATIONS

Alfred P. Sloan Foundation
Charles Edison Fund
The Hyde and Watson Foundation
Geraldine R. Dodge Foundation

PUBLIC FOUNDATIONS

National Science Foundation
National Endowment for the Humanities

PRIVATE CORPORATIONS AND INDIVIDUALS

Alabama Power Company
Amerada Hess Corporation
AT&T
Atlantic Electric
Association of Edison Illuminating Companies
Battelle Memorial Institute Foundation
The Boston Edison Foundation
Cabot Corporation Foundation
Carolina Power and Light Company
Consolidated Edison Company of New York, Inc.
Consumers Power Company
Corning Glass Works Foundation
Duke Power Company
Exxon Corporation
Florida Power & Light Company
General Electric Foundation
Gould Inc. Foundation
Gulf States Utilities Company
Idaho Power Company
International Brotherhood of Electrical Workers
Iowa Power and Light Company
Mr. and Mrs. Stanley H. Katz
Matsushita Electric Industrial Co., Ltd.
McGraw-Edison Company
Middle South Services, Inc.
Minnesota Power
New Jersey Bell Telephone Company
New York State Electric & Gas Corporation
North American Philips Corporation
Philadelphia Electric Company
Philips International B.V.
Public Service Electric and Gas Company
RCA Corporation
Robert Bosch GmbH
San Diego Gas & Electric
Savannah Electric and Power Company
Schering Plough Foundation
Texas Utilities Company
Thomson-Brandt
Transamerica Delaval Inc.
Westinghouse Educational Foundation
Wisconsin Public Service Corporation

THOMAS A. EDISON PAPERS

Reese V. Jenkins
Director and Editor

Thomas E. Jeffrey
Associate Director and Microfilm Editor

Assistant Editors
Paul B. Israel
Robert A. Rosenberg
Keith A. Nier
Andrew Butrica

Research Associates
Douglas G. Tarr
Mary Ann Hellrigel
David W. Hutchings

Assistant to the Director
Helen Endick

Secretary
Grace Kurkowski

Student Assistants
Leonard DeGraaf
Alan Stein
Jacquelyn Miller
Joseph P. Sullivan
Karen Kozak
Granville Miller

Thomas A. Edison Papers
at
Rutgers, The State University
endorsed by
National Historical Publications and Records Commission
18 June 1981

The original documents in this edition are from the archive at the Edison National Historic Site at West Orange, New Jersey.

Thomas A Edison Papers

A SELECTIVE MICROFILM EDITION

PART II
(1879–1886)

Thomas E. Jeffrey
Microfilm Editor and Associate Director

Paul B. Israel
Assistant Editor

Mary Ann Hellrigel
David W. Hutchings
Douglas G. Tarr
Robert A. Rosenberg
Editorial Associates

Leonard DeGraaf
Joseph P. Sullivan
Alan Stein
Karen Kozak
John Deasey
Barbara B. Tomblin
Jacquelyn Miller
Maria Antonakakis
Student Assistants

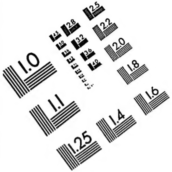
Keith A. Nier
Assistant Editor

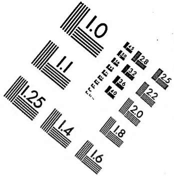
Reese V. Jenkins
Director and Editor

Sponsors
Rutgers, The State University of New Jersey
National Park Service, Edison National Historic Site
New Jersey Historical Commission
Smithsonian Institution

University Publications of America
Frederick, Maryland
1987

Association for Information and Image Management





MS303-1980